MYRMECIA

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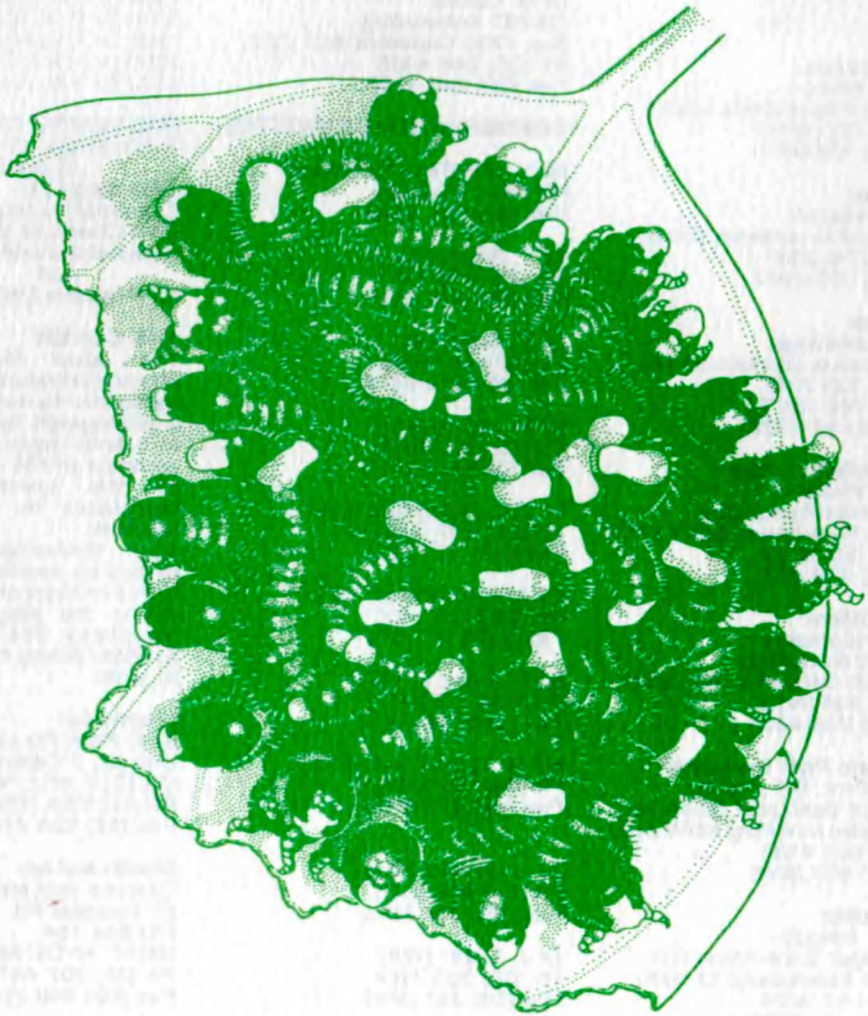

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1986 Dr R.W. Sutherst
1988 Dr T.R. New
1990 Dr R.A.I. Drew
1992 Dr E.S. Nielsen

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THE COVER
The cover for this year's *Myrmecia* features an illustration by Karina Hansen McInnes from a photograph by Penny Gullan of a larval mass of *Perga affinis* complex (HYM: Pergidae), one of the common species complexes in the Australian sawflies.
The formation of these defensive rosettes, which are a common sight on eucalypt trees during the day, is known as cycloalexy. The larvae form the rosettes during the day and feed at night.

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The Directory of South-West Pacific Entomologists

Due to a poor response from AES members, the publication date of this Directory has been delayed. **Current members who have not returned a completed form will be included in the list, but only with the following details:**

Title, Initials, Family Name
Address (as registered with the Society).

Members who have completed and returned the form will have full details:

Title, Initials, Given Name, Family Name, Address, Telephone, Fax Number, E-mail address, Interests.

If you have not completed and returned your form but wish to have a full entry in the Directory, please send your details, **by 9th September 1994** to:

John Jennings,
Dept of Crop Protection,
Waite Campus,
University of Adelaide,
Glen Osmond, SA 5064

or FAX to 08 379 4095

Select interests from the following list but please do not include more than two.

Agricultural Entomology
Forest Entomology
Veterinary Entomology
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Urban Entomology
Quarantine Entomology
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Behaviour
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Collector
Illustration and Photography
Morphology
Physiology
Biochemistry
Palaeontology
Genetics
Biological Control
Chemical Control
Cultural Control
Integrated Control
Pathology
Modelling
Molecular Biology
Conservation Biology
Environmental Biology

MYRMECIA

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These rates apply to camera-ready copy supplied by the advertiser. Where this is not supplied, an additional charge may be made for the layout.

In addition, loose inserts and pamphlets supplied by the advertiser will be included in a mailout for $100 per item. The items should be of a size which will not project beyond the pages of *Myrmecia*.

NOTICE

Statements made in *Myrmecia* do not necessarily represent the views of the Australian Entomological Society. Items printed herein should not be reproduced without permission of the author of the material.

COPY DEADLINE FOR NEXT ISSUE

Material for publication in the August 1994 issue of *Myrmecia* should be in the hands of the Editor at the address below by **Friday 21 October 1994**. Submission on IBM-compatible floppy disk in a major word processing format is preferred. Details are available from the Editor.

Murray FLETCHER
News Bulletin Editor
Biological and Chemical Research Institute
PMB 10, Rydalmere, NSW 2116
Copy can also be sent to the editor via email to the address fletchm@agric.nsw.gov.au

EXECUTIVE REPORT

Meetings

The Core Executive met on 29 March, 18 April, 19 May and 14 July 1994

New Members

We welcome the following new members to 1994 membership:

Elected 29 March 1994

Mr T. WOODGER, c/o Bohle PO, Townsville Qld 4810. Terry is an Environmental Officer.

Mr R. WYLDE, 24 Waratah Way, Wodonga Vic 3690. Robert is a student enrolled in the Applied Science Course at La Trobe University (Wodonga).

Elected 18 April 1994

Dr M.-C. LARIVIÈRE, PhD, Mt Albert Research Centre, PB 92 170, Auckland NEW ZEALAND. Dr Larivière is a systematist/curator of the Hemiptera and has an interest in the biosystematics of the Heteroptera / Auchenorrhyncha.

Elected 19 May 1994

Miss A. CRUSE, BSc(Hons), 138 Herring Rd, North Ryde NSW 2113. Aletha is a PhD

Student of Biology at Macquarie University where she is studying antibiotic properties in termites.

Dr R.B. FLOYD, PhD, CSIRO Entomology, GPO Box 1700, Canberra ACT 2601. Robert is a Research Scientist with an interest in the feeding of insects on eucalypt and other Australian trees.

Mr J.N. MATTHIESSEN, BSc, CSIRO Entomology, Private Bag, Wembley WA 6014. John is a Research Scientist with interests in applied insect ecology, integrated pest management and soil insects.

Dr D.J. THACKRAY, PhD, Division of Plant Industry, WA Dept of Agriculture, Baron-Hay Court, South Perth WA 6151. Deborah is a Research Officer involved in studies of host-plant resistance to insects and mites and in culturing and mass-rearing these arthropods.

Elected 14 July 1994

Mr J.E. CURTIS, BSc(Agr)(Hons), Institute for Hort. Development, PB 15, South Eastern Mail Centre, Vic 3176. John is a Technical Officer at the Institute and is a Masters Student at the School of Agriculture, La Trobe University. He is involved in studies of the augmentation of biological control of potato moth.

Miss C.L. DAY, BSc, 15 Second Ave, Kensington WA 6151. Miss Day is an Honours Student at Curtin University where she is studying the invertebrates of wheat-belt leaf litter.

Ms N.J. KEALS, BAppSc(Hons), 4 Marchamley Place, Carlisle WA 6101. Natalie is a Research Assistant and has interests in the re-colonisation of rehabilitated areas.

Ms H.S. DUNGEY, BSc(Hons), Dept of Plant Science, University of Tasmania, GPO Box 252C, Hobart Tas 7001. Heidi is a PhD Student and is involved in studies of the susceptibility of hybrid eucalypts to pests, including insects.

Miss J.A. GRIGGS, BScAgr(Hons), PO Box 137, Huonville Tas 7109. Judi is enrolled as a Masters Student(Entomology) in the Dept of Agricultural Science, University of Tasmania.

Miss W.E. HARRIS, BScAgr(Hons), NSW Agriculture, PMB Myall Vale, Narrabri NSW 2390. Wendy is a Scientific Technical Officer and is engaged in studies of the development and implementation of IPM programs and biological control of crop pests, with emphasis on cotton pests.

Mr B. HOWLETT, BScAgr(Hons), 2115 Franklin St, North Hobart Tas 7000. Bradley is a PhD Student at the University of Tasmania where he is studying host-tree location by the eucalyptus leaf beetle *Chrysophtharta bimaculata*.

Ms P.S. HURST, BSc(Hons), School of Biological Sciences, Flinders University, Bedford Park SA 5042. Pamela is a PhD Student whose thesis is Social Organisation and Ecology of a semi-arid zone bee, *Exoneura (Exoneurella) tridentata*.

Mr I. LIT JR, Division of Botany and Zoology, School of Life Sciences, Australian National University, Canberra ACT 0200. Mr Lit is a PhD Student.

Dr R.K. PENG, PhD, Faculty of Science, Northern Territory University, PO Box 40146, Casuarina NT 0811. Dr Peng is a Research Fellow with experience in insect ecology and behaviour. He has a project on the effect of native vegetation on the cashew arthropod fauna.

Dr B. ROBERTS, PhD, Dept of Ecology & Evolutionary Biology, Monash University, Clayton Vic 3168.

Mr E. SOLEYMAN-NEJADIAN, MSc, Dept of Crop Protection, Waite Campus, University of Adelaide, Glen Osmond SA 5064. Ebrahim is a Postgraduate Student.

Mrs R. TALAEI, Dept of Crop Protection, Waite Campus, University of Adelaide, Glen Osmond SA 5064. Roya is a PhD Student and is involved in studies of the molecular biology of Hymenoptera.

Resignations from Membership

(received with regret)

Dr J.R. MACFARLANE
Dr D.P. SINCLAIR

Change of address or Title (Meeting in April)

Mr K.D. FAIREY, has returned to financial, full-member status

Mr A.K.IRVINE, CSIRO Wildlife & Ecology, PO Box 780, Atherton QLD 4883

Ms J. LAYLAND, c/o Mr J A Macdonald, North Coast Agricultural Institute, Bruxner Highway, Wollongbar NSW 2477

Mr E.L. MARTIN, status has changed to Retired, new address is 7 Nile Ave, Sandy Bay TAS 7005

Mrs L.J. McLEOD, 81 South St, Molong NSW 2866

Mr R.P. McMILLAN, 64 St Ives Northshore,

Dampier Ave, Kallaroo, WA 6025

Dr N. MONZU, has returned to financial, full-member status

Mr G.D. Murphy, Ontario Ministry Agriculture & Food, Vineland Station, Box 8000, Ontario LOR2EO CANADA

Prof. B.J. RICHARDSON, has returned to financial, full-member status

Dr J. VRANJIC, status change from Mr; address change to Laboratory of Ecological Zoology, Dept. of Biology, University of Turku, SF-20500 Turku 50 FINLAND

Dr D.K. YEATES, Dept. of Entomology, University of Queensland 4072

The following members have moved from the Victorian Dept. of Agriculture, Burnley, to the Institute for Horticultural Development, Private Bag 15, South Eastern Mail Centre, Victoria 3176:

Dr P.G. COLE
Miss N.M. ENDERSBY
Mr D.C. GLENN
Mr A. HENDERSON
Dr P.A. HORNE
Dr M.B. MALIPATIL
Mr J.A. OSMELAK
Dr P.M. RIDLAND
Mr A.M. SMITH
Ms C.A. SYMINGTON
Mr D.G. WILLIAMS

Other former Burnley members (below) are now located at Plant Sciences & Technology, Victorian Dept. of Agriculture, La Trobe University, Bundoora VIC 3083:

Mr G.N. BERG
Dr G. McDONALD
Dr J. WOODWARD

Change of Address or Title (Meeting in May)

Miss N. AGELOPOULOS, has moved overseas - address unknown

Dr D.A. BARRACLOUGH, status has changed to Full Member

BAYER AUST LTD, delete as Sustaining Associate

Mr M.F. BRABY, CSIRO Division of Entomology, GPO Box 1700, Canberra ACT 2601

Dr I.C. CAMPBELL, Dept of Ecology & Evolutionary Biology, Monash University, Clayton VIC 3168

Mr M.A. COLLIER, status change from Student to Full Member

Mr M.T. COOMBS, status change to Dr COOMBS

Dr S.A. CROSSLEY, has returned to financial Full Member

Ms K.F. DAVIES, 17 Barron St, Deakin ACT 2600

Dr C.E. HOELSCHER, his correct address is 411 Minnie Belle Heep, Building (2475), College Station, TEXAS, USA

Mr A.J. HUNT, CRC for Temperate Hardwood Forestry, Locked Bag 2, PO Sandy Bay TAS 7005

Ms M. JOHNSON, 227 Payneham Rd, St Peters SA 5069

Mr V.V. MADHUSUDHAN, has moved overseas - address unknown

Mr D.R. SPARKS, Dunsandle Station, Bourke NSW 2840

Ms T. WHARTON, 42 Pitt St, North Hobart, TAS 7000.

Dr J. WOODWARD, PO Box 335, Market St, Melbourne VIC 3000

Ms C.M. YULE, status change to Dr C M YULE

Change of Address or Title (Meeting in July)

Mr J. BALDERSON, c/o 20 Olympus Way, Lyons ACT 2606

Dr D.A. BARRACLOUGH, Natal Museum, is now a Full Member

Prof. T.O. BROWNING, No. 29 Victoria Grove, 258 Greenhill Rd, Glenside SA 5065

Mr J.E. CURTIS, Institute for Hort. Development, PB 15, South Eastern Mail Centre, Vic 3176

Mr E.C. DAHMS, 69 Ormskirk St, Calamvale Qld 4116

Dr P.B. EDWARDS, CSIRO Entomology, Box 1700, Canberra ACT 2601

Mr I.G. FAITHFUL, c/o 126 Nicholson St, Abbotsford Vic 3067

Mr G.R.M. GRANT, R32/356 Blunder Rd, Durack Qld 4077

Mrs L. GRBIN, formerly Miss L JOHNSON

HOECHST SCHERING AGREVO PTY LTD, 1731-1733 Malvern Rd, Glen Iris Vic 3146 (Attn. Mr RG Harris)

Mr P. JAMES, Entomology Dept, University of Minnesota, 219 Hodson Hall, 1980 Folwell Ave, St Paul Mn. 55108-6124, USA

Miss L. JOHNSON, Waite Campus, see under Grbin

Mr J.A. MACDONALD, NSW Agriculture, Tropical Fruit Research Station, PO Box 72, Alstonville NSW 2477

Mr C.P. MADDEN, Engineering & Water Supply

Dept, Private Bag, Salisbury PO, SA 5108. Chris is now a Full Member.

Mr I.J. TITMARSH is now Dr Titmarsh, with a new address of Dept of Primary Industries, PO Box 201, Biloela Qld 4715

Missing Members

The Society has lost contact with the following members. Please forward any known current address of any of these members to the Secretary:

Dr K.C. BINNINGTON
Mr K. FARROW
Mr V.V. MADHUSUDHAN
Mr W. ROCHESTER
Mr A.A. SANDERSON

From the Minutes of the Core Executive

There has been a poor response from members of the Society for entries in the new entomological directory. A final invitation is on page 1 of this issue of the News Bulletin. Financial members who do not respond promptly will have only their names and addresses in the directory; phone and fax numbers and details of areas of entomological interest will not be included. The delay because of the poor response of members is likely to result in the directory not being available for sale during the September meetings of the Society in Adelaide.

Submissions have been received from members for nominations for the Society's Ian Mackerras Award and for Honorary Membership of the Society.

Arrangements are being made for the Executive to publish the report "Listing of Invertebrate Conservation Research Titles, an Australian Survey", prepared by the Society's Conservation Committee. A summary of the report, a result of a most successful project, is presented on page 6 below by Mr Lionel Hill, Convenor of that Committee.

The Executive is considering both the selection of a Patron for the Society and members for the new AES Service Award. The award is an Executive award recognising outstanding service to the Society.

The Executive is examining ways in which funds could be found to assist in completing and publishing a proposed new Australian entomological bibliography.

Arrangements are under way to have a plaque unveiled during the Society's meetings in Adelaide in September which will recognise the role played here in the first major, and successful, biological control program - control of cottonycushion scale in California citrus orchards with the "Australian" vedalia ladybird in the 1880s.

Five submissions for the Phil Carne Student Prize and three for Research Grants are being examined by Review Committees.

A notice appears in the box above of the areas of interest which will be covered by the new position of Assistant Business Manager (Promotions Officer).

PROMOTIONS OFFICER

The Executive is seeking expressions of interest from members to fill the honorary position of Society Promotion Officer.

This position offers a member the opportunity to contribute greatly to the promotion of the Society and entomology to governments, industry, the scientific community and the public, and to gain wider personal experience.

The position requires a person who is lateral thinking and not restrained by past conventions. The person can be based in any State or Territory and will interact closely with the Business Manager, the Editor of *Myrmecia* and the Core Executive.

The Executive of the Society strongly believes that active promotion of entomology and its successes is required in an attempt to counteract the budget constraints suffered by the discipline in recent years.

We have a saleable commodity
Let us capitalise on it!

Interested members are requested to inform Dr Paul Madge, Hon. Secretary, by 9 Sept. 1994 (Phone/Fax 08-370 2987). For further information, contact Dr Peter Allen, Vice President (phone 08 303 9530)

The Treasurer, John Jennings, has tabled an audited 1993 financial report for the Society which will be presented at the Annual General Meeting in September. He has also developed a program which greatly simplifies the preparation and posting of subscription notices.

Dr Alan Yen represented the Society at a workshop held in Melbourne in June to determine support for the formation of an Australian Biodiversity Council. The meeting agreed to work towards launching the Council in November 1994. Further details will be presented in the next issue of Myrmecia.

Paul MADGE
Hon. Secretary

CONSERVATION COMMITTEE REPORT

The survey of invertebrate conservation projects has turned up a surprising number of current or very recent research projects. The Society will publish a report tabulating brief details of these 146 projects and researchers. This will be released in September at the Adelaide conference.

Of 190 researchers or institutions approached by postal questionnaire, 107 responded. State and Federal agencies were involved in 42% of projects, universities in 35%, museums in 10% and CSIRO in 8% of projects. Although around 20 projects concerned specific butterflies, most projects embraced higher level taxa such as "invertebrates", "insects" or "beetles". Oligochaetes, gastropods and arachnids were each the subject of around 3% of projects. A quick scan over the tabulation of projects suggests there is much scope for coordination of efforts. Hopefully the inclusion of phone numbers of project leaders will facilitate this.

The report will detail titles, aims, leaders and phone numbers for 146 projects that have non-marine invertebrate conservation as a primary or substantial aim. Postal addresses of many researchers will also be given.

Hopefully, the survey will be repeated on a regular basis taking into account comments on this first effort.

Lionel HILL
Convenor

INVERTEBRATE SITE REGISTRATIONS IN SOUTH EASTERN AUSTRALIA

Final report on project with the Australian Heritage Commission.

This project was first announced in *Myrmecia* two years ago when members were asked for details of invertebrate sites which might have National Estate values by reason of their fauna. We eventually ended up with several hundred suggestions for south east Australia and nominations for thirty sites (eight sites in Victoria, ten in South Australia and New South Wales each and two in the ACT see list below) have been completed and submitted to the Australian Heritage Commission. Of these 15 have been processed and placed on the interim list. The announcement of the invertebrate sites was timed to coincide with the 20 year celebrations of the AHC and there was considerable media coverage for the event which proved to be an excellent promotion of invertebrate conservation. A press conference was organised in Parliament House where the invertebrate sites, together with some geological and aboriginal Dreamtime sites were announced. At it we were able to have a display of some of the species involved in our nominations. A full report on the project was submitted as a paper to the proceedings of the Brisbane Conference on Invertebrate Conservation last July (Memoirs of the Queensland Museum) which will be published in the next month or two.

STATE NOMINATIONS

Australian Capital Territory

1. Morabine grasshopper - Tidbinbilla National Park
2. Castaniid moth - Belconnen Naval Base.

New South Wales

1. Coleoptera and Diptera - Harrington-Crowdy Head littoral rainforest
2. Bathurst Copper butterfly sites
3. Butterfly hilltopping site- Mt Ramornie.
4. Spider - Carrai Bat Cave.
5. The Wog Wog patch experiment.
6. Fowler's Gap.
7. Buprestids - Castlereagh woodlands.
8. Diptera - Mooney Mooney Creek.

9. Flightless carabid - Lismore Rotary Park .
10. Flightless carabid - Alexandra Park.

South Australia
1. Fiery Jewel butterfly - Innes National Park.
2. *Ogyris otanes* butterfly - Innes National Park.
3. The *Nothomyrmecia* ant - Poochera.
4. A tettigoniid site - Darke Peake.
5. Mayflies and stoneflies - Tookayerta Creek.
6. Syncarid crustacean - Fossil Cave.
7. Trapdoor spider - Nullarbor Cave.
8. 540 species of insects and spiders - Aldinga Scrub Reserve.
9. Rare Lepidoptera and other insects - Hallet Cove.
10. Type locality for Coleoptera - Ooldea Soak .

Victoria
1. Mayfly - Wilson's Promontory National Park.
2. The giant Gippsland earthworm - Mt Worth National Park and private land.
3. Burrowing crayfish - Warragul.
4. Stonefly - Mt Stirling.
5. Stonefly - Mt Donna Buang.
6. Stonefly - Otway Ranges.
7. Butterfly hilltopping site - Mt Piper.
8. Butterfly hilltopping site - mallee country of northwestern.

I would like to thank very sincerely all those, including numerous members of the Society, who contributed to the successful completion of the project (listed below).

The following persons prepared or gave major assistance with nominations; J. Anderson, G. Carruthers, R. Coy, E. Dexter, R. Fisher, M. Gray, A. Greig, C. Margules, J. Roberts, and G. Williams.

Others provided information or photographic material and contributed in various different ways: F. Badman, D. Britton, D. Cosby, E.D. Edwards, W. Green, P.J.M. Greenslade, G. Gross, C. Harris, D. Hayston, W. Horning, P. Horwitz, P. Horne, A. Jelinek, K. Key, R. Kitching, J. Lawrence, P. Lillywhite, I. Lundy, D. McAlpine, M. MacBriar, A. McLennan, P. McQuillan, E. Matthews, J. Matthews, G. Milkevits, C.G. Miller, J. Moffitt, G.B. Monteith, B.P. Moore, K. and L. Mudge, F. Neumann, T.R. New, V. Pettigrove, W. Ponder, D.C.F. Rentz, B. Richardson, P. Souter, A. Sundholm, R.W. Taylor, B. Van Praagh, A. Yen, W. Zeidler. I am most grateful to all these people. Many others contributed in less major but no less essential ways but are too numerous to list here.

The message of this note is that you should not rest on your laurels as I have an identical project in Tasmania and Queensland (ten sites to be nominated in each State) and am anxious for suggestions from you for these areas. So please let me know if you have any pet sites worthy of nomination in these States.

Penelope GREENSLADE
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Canberra, ACT 2601
Tel: (06) 246 4121
Fax: (06) 246 4000
email: pennyg@ento.csiro.au

OBITUARY
Alexander Noble Burns
1899 - 1994

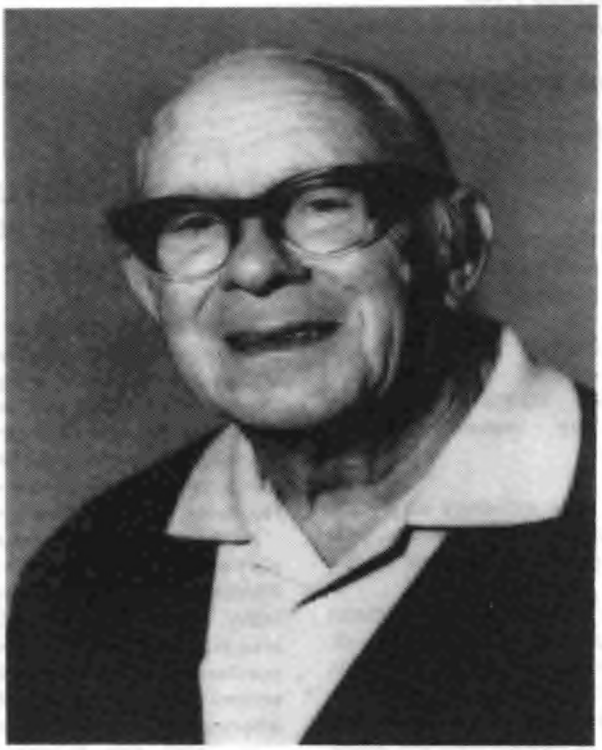
Born June 20th 1899 at Melbourne. "Noble" was his mother's maiden name - Florence Noble. His father, John Burns, emigrated from Perthshire, Scotland, in 1856 with a brother, Henry Burns. Alex was the only son from his father's second marriage. Typhoid fever killed his first wife and two daughters, and two sons were killed in accidents. However, one son and a daughter survived.

At three weeks of age Alex left Melbourne with his mother for his parent's property "Jerra Jerra" at Kookardinia between Wagga Wagga and Holbrook, NSW. At the end of 1903 his father sold the property and went to live in Melbourne having purchased a home in Elsternwick. Alex started school at a small private primary school and afterwards went to Caulfield Grammar School.

In 1910 the family (Alex, father, mother, stepbrother Philip and stepsister Henrietta) sold up and went to live on a 34 acre property at Lower Ferntree Gully, where they planted 2½ acres with fruit trees, as well as growing various vegetables and food for their four cows. At this time Alex, now aged 12, set up an apiary and produced honey - he also reared queen bees. However, this was not his first interest in the subject of Entomology which began around the age of 6 to 8 years when he was first interested in butterflies. His parents and his stepsister appreciated natural history and encourage his interests in things zoological and botanical.

Alex continued his education at Ferntree Gully and went on to obtain his Merit Certificate from Swinburne Technical College at Hawthorn. He commuted daily by steam train. Following this he spent 18 months helping out his father on the property after which he decided that he wanted to matriculate. Accordingly he went to Sydney to study privately. He stayed at Rose Bay with his father's cousins - two elderly spinsters, Misses Sterling. During this time he had a part time job with a steam ship company (Huddart Parker Pty Ltd), working from 1pm to midnight (sometimes longer) checking cargo, for the then not insignificant wage of 8 pounds sterling per week. Out of this he paid 25 shillings full board.

This open a new phase in his life as he spent some of his free time visiting the Australian Museum in College Street, Sydney, where he was befriended by the later mr Anthony Musgrave and the late Dr G.A. Waterhouse, the latter taking him on field trips including a trip to Ballina, then a small fishing village, for three weeks, where he recalled staying at the Commercial Hotel at 25 shillings per week for full board. Nineteen months later, without having matriculated, he went home to Melbourne at the age or 15 or 16.



Alexander Noble Burns, 1899-1994

In July 1916, at the age of 17, he joined the Victorian Field Naturalists' Club, having been proposed by Frank Palmer Spry, the National Museum entomologist, and seconded by James Kershaw, the Museum Director. In 1919 he went on a trip to Brisbane and met the Queensland Museum entomologist Henry Hacker and George Hardy, later of the University of Queensland Biology Department. Hardy suggested Burns take a position with the Commonwealth Prickly Pear Investigation Unit at Sherwood, under the Bureau of Science and Industry - the forerunner of the CSIRO.

Hardy arranged for Alex to meet Professor Thomas Harvey Johnston, who headed the Commonwealth Prickly Pear Laboratories from 1920 to early 1923. (The Commonwealth Prickly Pear Board with the task of eradication of *Opuntia* spp was initially under the leadership of W.B. Alexander (1924-25) and then from 1925 by Alan Parkhurst Dodd. It was they who introduced the moth *Cactoblastic cactorum* which successfully controlled and almost eradicated *Opuntia* spp from the semi-arid areas of western Queensland and NSW).

During the period 1920 to 1922, Alex worked for the Queensland Department of Agriculture (forerunner to the DPI) at the Acclimatisation Gardens, Petrie, near Brisbane, researching insects of crops. Then, in 1923 at the age of 23, he commenced work with the Commonwealth Prickly Pear Board, initially as officer in charge at Biniguy NSW and later as o-i-c Westwood P.P. Field Station, near Rockhampton, where he worked with the recently deceased Jack Mann (later Assistant Government Entomologists) until

sometime in 1925.

Alex worked there for two years and four months, following which he worked with the Bureau of Sugar Experiment Stations at Meringa near Gordonvale for another two years. He then went on to become Entomologist in charge at Mackay.

At the end of 1929, at age 30, he returned to Melbourne and Ferntree Gully where he helped his father and stepbrother on the farm. Here he finally matriculated. Alex recalled that he was particularly good at algebra which was his best matriculation subject - he finished the exam an hour early and was awarded a mark of 100%! In 1930 he went on to the University of Melbourne to graduate, in 1933, in Science with Honours majoring in Entomology.

It is not clear what transpired in the next six years but in 1939 Alex and family went to England. They sailed on the *Stratheden*, a P&O liner, leaving Melbourne on Tuesday 20th February. He bought an old 32hp Buick for £55 and did an incredible 2,494 miles touring in England, Scotland and Wales and, in between, managed to study the Australian butterfly types in the British Museum (Natural History) as well as rekindling an interest in orchids.

Aware that war was imminent in Europe, he sailed for Australia on August 19th on the steamship *Maloja* but was offloaded in Bombay. He spent 6 weeks in India and resumed passage to Australia on the *Stratheden* arriving in Melbourne on October 8th - war having broken out on September 17th. He joined the army in Melbourne as a private and was promoted to corporal after 5 weeks and sergeant 8 weeks after that. He was commissioned 5 months later into the Intelligence Corps and served initially at H.Q. in the Public Library of Victoria! Later he served in England, Egypt, India and the Pacific Islands, but had no opportunity to collect butterflies or study orchids. However, a friend, one of six Australian soldiers who survived the Sandakan (Borneo) "death march" brought back Alex some Bornean butterflies. This man, who survived the final machine gunning, was looked after by Dyak tribespeople, living with them for 6 months before being found by Coast Watchers. Another serviceman brought him a large collection of beetles and other insects from Bougainville, collected whilst on active service in the Solomons. He kept these collections in store boxes and they were amongst his fondest treasures.

After the war he was demobilised in Melbourne but not before running across Dick Prescott who was Government Entomologist before the war. Dick had just been appointed Director of the National Museum of Victoria and was looking for somebody to take on the position of Curator of Entomology. Accordingly, Alex asked his C.O., Lt. Col. Gray for a speedy discharge. Within a week he was out of the army and on to the Museum's staff. This happened in December 1945, not long after V.J. day.

Alex was awarded an M.Sc. by the University of Melbourne in 1956 for a thesis on butterflies, although most of his work at the Museum was (officially) on other insect groups including the Cicadidae, on which he wrote several papers, mainly generic revisions with descriptions of new species, some of which were published and other which were not. He produced a "Checklist of Australian Cicadidae" in 1957 which listed all the species known up to that time. Prior to that, the only useful works on Australian cicadas were the 1904 monograph by Goding and Froggatt and the 1906 Synonymic Catalogue of world species by Distant. These were augmented by some patchy additional descriptions by Kirkaldy (1909), Ashton (1914) and Hardy (1917), but no serious work had been attempted in the intervening 40 years!

Alex developed an interest in cicada even before the war but it wasn't until the mid 1950's that he did some taxonomic work. Butterflies were his first love, orchids his second, and this interest in orchids was spurred by his visits, prior to the war, to Kew Gardens where he was encouraged by a Mr Gilmore, the then curator. These interests brought him to Queensland many times and were instrumental in his acquiring a property at Burleigh Heads on the Gold Coast in 1952. This wasn't his first Queensland property, however, as his initial acquisition in 1948 was a house at Kuranda on 500 acres purchased for £500 with the assistance of a "local" friend, the renowned entomologist F.P. Dodd. His grand-daughter Beverley remembered staying there with him when she was about 5 years old.

After his compulsory retirement at the age of 65 in 1965 after 21 years service at the Museum, he and his second wife moved permanently to Queensland.

Alex was first married in 1923 to Marguerite Pickett, at Ringwood in Victoria and (in his terms)

the "stormy marriage" resulted in the birth of two daughters, Margaret Jean (Peg) in 1925 and Dorothy Ann in 1929. The latter, who never married, lived in Montalbert, a suburb of Melbourne. Peg married, moved to Albury NSW and was subsequently divorced. However, she had one daughter, the aforementioned Beverley, who was born in November 1946 and who married a Mr Peter Fealy. She now lives and works as a teacher in the Springwood area of southern greater Brisbane. She has a son, Damon, and two daughters, Shaan and Allison. In spite of the circumstances of his first marriage, Alex maintained a close association with his only granddaughter and great grandchildren, who cared for him in his later years.

His second "wonderful" wife, Merle Dulcie Scott, whom he married in December 1944, died in 1979. Mrs Ena Mitchell had been his part-time housekeeper for about 15 years and helped nurse the ailing Merle in the 5 years prior to her death. Ena retired from Alex's service in 1989 just before she turned 80.

Alex's last two years were spent at the Hope Island "Sanctuary Care" aged persons hostel. Prior to this he was quite active for his years, spending much time in his orchid garden and in the adjacent Burleigh Heads National Park, observing his beloved butterflies, including the Richmond Birdwing, *Triodes richmondia*, still reasonably common in the midst of an expanding urban landscape. His last project was in assisting Alex Griffiths to put together a collection of local butterflies at the nearby Currumbin (Bird) Sanctuary. He was quite proud of the fact that he never suffered from "colds" or "flu" and that he had never been in a hospital until 1988 when, at age 89, he successfully underwent a prostatectomy operation.

His death on 6th June 1994, 14 days before his 95th birthday, came 29 years after his retirement. he had a small memorial service at "Allambie Gardens" Nerang and was buried on 16th June in Lilydale Cemetery Melbourne, adjacent to the grave of his second wife Merle who had died 15 years earlier. A few of his contemporaries and some former colleagues were present at the funeral service.

Alex's publications included about 20 papers on systematic entomology, including the aforementioned cicada works. He wrote a National Museum of Victoria handbook "Notes on the Collecting and Mounting of Insects" and co-authored two popular books on butterflies: "Butterflies of Australia and New Guinea" with naturalist Charles Barrett and "Australian Butterflies in Colour" with photographer Ted Rotherham.

Amongst Alex's other accomplishments were his founding membership of the Entomological Society of Queensland in 1923, and his longest serving membership (since July 1916) of the Victorian Field Naturalists' Club, of which he became honorary life member in 1956, after 40 years. He was made a Fellow of the Royal Entomological Society in 1923 and a Fellow of the Royal Horticultural Society in 1938.

In February 1986 he was awarded an Honorary Doctorate of Science from the World University, Tucson Arizona, USA and gained membership of the Biographical Institute at Cambridge with the awarding of a "medal of outstanding achievement" and naming in their honours list as one of the first 200 "Commonwealth achievers" as published in "Who's Who of the Commonwealth".

Although Alex had maintained that his own large private butterfly collection (about 26,000 set specimens in about 10 cabinets and many storeboxes) and his rare book collection were to be donated to the Museum of Victoria following his death, this apparently was not the case, with only the butterfly holotypes and allotypes being so bequeathed. Most of the non-butterfly material was in fact sold to the Museum about 10 years ago and the butterfly types were collected more recently. The bulk of his collection remains for his beneficiaries to dispose of - hopefully this will eventually find its way to the Museum of Victoria or some other suitable Australian Institution where research workers will have access for study purposes.

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AES Research Grant Report

Survey of Central and North Queensland Chrysopidae (Neuroptera).

Report to the Executive of the Australian Entomological Society (1994).

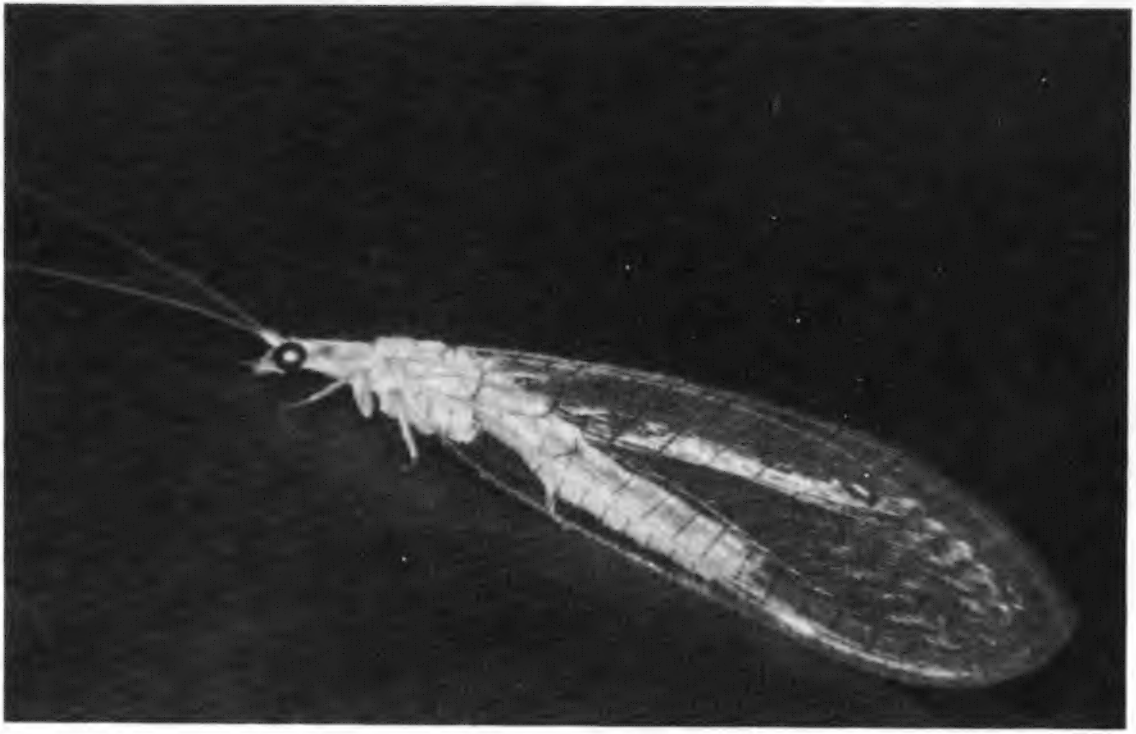
Introduction.

The Australian Chrysopidae (Neuroptera) are a poorly studied group consisting of 62 species across 18 genera (Winterton, in prep). Unfortunately during the past century, taxonomic uncertainty has necessitated that the treatment of chrysopids in ecological studies remains at the family level as "generalist predators of soft bodied phytophagous insects". In many instances various species assemblages of chrysopids have been lumped together by default under the collective term "*Chrysopa* species". Consequently this superficial treatment of the group has impeded the accumulation of information on the biology and distributions of individual species. Interestingly enough though, only 3 Australian species remain in the genus *Chrysopa* Leach, simply because there is insufficient evidence to justify their transferral to other genera to which they most probably belong.

There is a high level of endemism in the Australian Chrysopidae with the greatest level of diversity in northern Australia. The full distributions of most species are yet to be properly ascertained as many are known from only a few specimens with collections concentrated around populated southern regions. This paucity of collections in northern Australia prompted this study.

Objectives.

The objectives of this study were to survey Chrysopidae initially in areas of central and



Mallada traviata (Banks), Chrysopidae

northern Queensland from Rockhampton to Cooktown and inland to the Great Dividing Range. Subsequent surveys also included much of southern Queensland including St. George and Charleville in the west, to Brisbane in the east. Results of these collections have been included also. These surveys were designed to:

(I) present a synoptic account of species of the regions with the possibility of collecting undescribed species,
(ii) document the distributions of species collected in these regions,
(iii) where certain species have extensive distributions; compare external and genitalic morphology of representatives of those species over that range,
(iv) serve as a preliminary or base study from which more extensive, longer term sampling strategies may be developed.

Survey Area.

The collection period went for approximately 10 months during late 1993- early 1994, encompassing most of the warm season when lacewings are most active. Collections were most frequent in southern and central Queensland, with 4 collecting trips to northern Queensland made in September and November of 1993, and February and April of 1994. Results from those sites that were most productive for lacewing collecting are included here. These generally were coastal sites east of the Great Dividing Range. Collections at sites in far north Queensland and inland areas were dominated by Myrmeleontidae and Ascalaphidae.

Adults and larvae where collected using sweep nets during daylight hours. Larvae were reared to adults for accurate species identification as no comprehensive key to larvae of Australian Neuroptera exists. Adults were also collected using light traps. The bulk of collections were made at night.

Collection Sites.

West Brisbane: This region had selected sites at Mt. Coottha, Indooroopilly, Ipswich, Brookfield, and Ferny Hills. The dominant vegetation ranged from Camphor laurel (*Cinnamomum camphora* (L.) Nees) with undergrowth of exotic "garden" species along a creek bed at the Indooroopilly site, to dry, *Eucalyptus* spp. bushland at the Ipswich and Brookfield sites. The CSIRO, Long Pocket Laboratories are located in this region. The dominant vegetation at the site is a small pocket of planted rainforest.

North Brisbane: This region encompassed areas such as Caboolture and the Sunshine Coast. The dominant vegetation ranged from open bushland to pockets of temperate rainforest.

Gatton: Agricultural areas dominated by cotton and lucerne field crops with isolated pockets of open eucalypt forest.

Toowoomba/ Highfields: Sites were located along Great Dividing Range escarpment. Open dry sclerophyll forest with lantana and privet (*Ligustrum lucidum* Aiton) understorey. Regular collections were also made in cotton and lucerne cropping areas on the eastern Darling Downs

St. George/ Charleville: Dry, cleared grazing land with isolated patches of open sclerophyll forest.

Bribie Is: Dry, sandy heathland dominated by *Banksia* spp.

Rockhampton: Eucalypt and grassland adjacent to the University of Central Queensland; incorporating Limestone Ck. where the dominant vegetation was rubber vine (*Cryptostegia grandiflora* (Roxb.) R. Br.), lantana and *Leucaena leucocephala* (Lam) De Wit.

Townsville: Collection site consisting of dry, open bushland dominated by Eucalyptus sp. with Chinee Apple bush (*Ziziphus mauritiana* Lam.) understorey.

Paluma/Mutarnee/Bluewater: A series of collection sites in closed rainforest located adjacent to Mt. Spec National Park. Specimens were also collected from tropical fruit orchards at Mutarnee and Bluewater.

Ingham: Predominantly sugarcane growing area with isolated patches of dense forest along creek banks.

Mission Beach: Dense rainforest area with high rainfall. Collections were made in open and closed forest areas close to the Mission Beach township.

Gordonvale/Cairns: Sugarcane growing region surrounding areas of tropical rainforest. Collections were made predominantly close to forested areas.

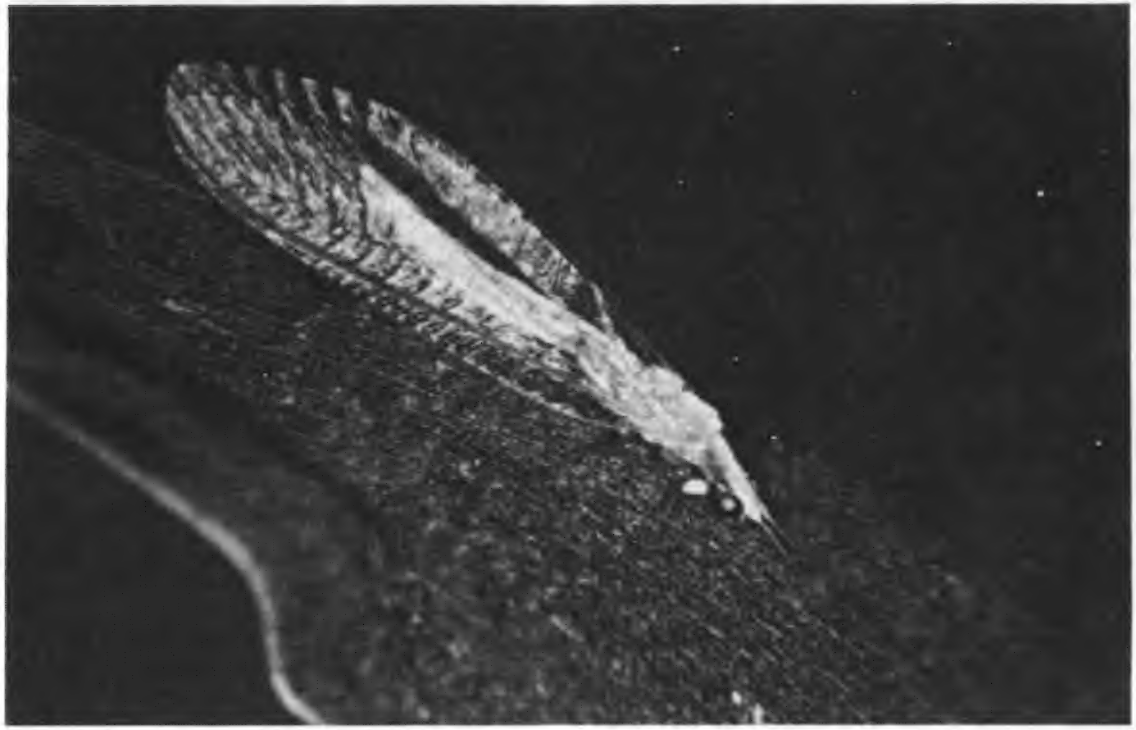
Results.

The following is a brief summary of some of the more interesting aspects of the biology, distributions, etc. of the Chrysopidae collected during this study. A total of 72 species across 41 genera of Neuroptera were collected, including 18

species from 9 genera across all 3 subfamilies of Chrysopidae. Of the 12 families represented, the Chrysopidae and Myrmeleontidae were the most common. Members of the genus *Mallada* Navás were by far the most abundant (7 species collected), representing the dominant genus of Chrysopidae at all but one collection site. No chrysopids were collected from the Highfields site over the entire period, with *Theristria* spp. (Mantispidae), and *Glenoleon* spp. (Myrmeleontidae) the dominant genera present. By contrast collections close to the nearby city of Toowoomba yielded large numbers of chrysopids (9 species) with *M. signata* (Schneider) the most abundant species. Chrysopids were most active during the warmer months (September- May) with certain species displaying distinct peaks in numbers at different times of the year. Most other Neuroptera collected over the period were in very low numbers or as singletons, and were collected over the entire period irrespective of the time of the year.

M. signata although not the most abundant species, was the only lacewing recorded from every site surveyed. It was most abundant in agro-ecosystems (e.g. cotton and lucerne crops) rather than native vegetation and in many instances was the only chrysopid present. Populations peaked around early September to late October with greatest numbers recorded from the Toowoomba, Gatton, Charleville and the Darling Downs. *M. signata* was recorded from coastal regions (e.g. Brisbane- Gordonvale) only in very low numbers. It is a highly distinctive lacewing with prominent yet somewhat variable head and pronotal markings and appears to have great potential for commercial mass rearing for use as a biological control agent in IPM programs.

M. basalis (Walker), *M. innotata* (Walker) and *M. traviata* (Banks) were the most abundant chrysopids in coastal areas, with *M. basalis* more common in northern Queensland. *Plesiochrysa*



Chrysoperla otalatis (Banks), Chrysopidae

atalotis (Banks), *Ankylopteryx pallida* Banks and *Glenochrysa opposita* (McLachlan) were common in humid, densely forested areas at the Paluma and Brisbane sites. The relatively rare *M. personata* (Navás), described from specimens from Sydney and Carnarvon was collected (adults and larvae) from the CSIRO, Long Pocket site at Indooroopilly (Brisbane). This species is poorly represented in Australian insect collections and specimens will be deposited in the Australian National Insect Collection accordingly.

One of the primary aims of this survey was the possible collection of previously undescribed species. A single undescribed species of *Mallada* ("*albofacialis*") was collected from Brisbane, Rockhampton and Townsville. This species is relatively common in forested areas around Brisbane. A description of which is currently in preparation.

Larval stages were collected for all species of *Mallada* and *Plesiochrysa* recorded (see below), as well as *G. opposita* (McLachlan) and *Chrysoperla otalatis* (Banks). Only larvae of *C. otalatis* did not carry a debris packet entangled in setae on their dorsum. This corresponds to other species of *Chrysoperla* described from overseas (Tauber 1974). Undescribed larval stages were also collected for other Neuroptera including: *Ditaxis biseriata* (Westwood), *Theristria discolor* (Westwood) (Mantispidae); *Myrmeleon acer* Walker (Myrmeleontidae); *Suhpalacsa flavipes* (Leach) (Ascalaphidae); *Austroneurorthus brunneipennis* (Neurorthidae); *Micromis timidus* Hagen and *Notiobiella viridis* Tillyard (Hemerobiidae). Adults and larvae of *M. timidus* and *N. viridis* were collected from stands of *L. leucocephala* growing on the banks of Limestone Ck. (Rockhampton), where they were feeding on large numbers of leaf hoppers (Hemiptera: Cicadellidae) and aphids (Hemiptera: Aphididae).

Of the five Australian species of *Chrysoperla*, only *C. otalatis* was collected during this survey, recorded at all south-east Queensland sites as well as Rockhampton and Townsville. Adults were collected throughout spring and summer, with peaks in numbers around late autumn. During this time approximately 10% of individuals collected in Brisbane and Toowoomba had undergone a colour change from green to brown/red. In the northern hemisphere adult colour change is recorded in *C. carnea* Leach, where it is associated with adult diapause and camouflage in deciduous forests (Macleod 1967). This diapause associated colour change is previously unrecorded in Neuroptera from the southern hemisphere. No variation in colour was observed in individuals collected from central and northern Queensland.

Both *Oligochrysa lutea* (Walker) and *Dictyochrysa peterseni* Kimmins were only collected from west Brisbane. Although *O. lutea* is found along the length of the east Queensland coast. Both were found in densely forested areas where *A. pallida* was also collected. *O. lutea* was active throughout the survey period (spring-autumn) while *D. peterseni* was collected at the Long pocket site only, representing a new distribution record for this species. Approximately a dozen individuals were recorded at this site over the period of a week during May.

Variations in external morphology or genitalic shape between geographical regions were exhibited by only two species collected during this survey. Specimens of *Plesiochrysa atalotis* (Banks) from north Queensland displayed slightly darker pronotal markings than those collected in south-east Queensland, as well as distinct black marks on the inner surface of the antennal scape and pedicel. These marks were absent in most southern specimens.

A great deal of variation was displayed in the face and vertex markings of *M. traviata* specimens collected from Rockhampton. The type description describes "narrow crescents flanking antennal sockets; genae and lateral margins of clypeus dark. Vertex unmarked..."(New, 1980). Rockhampton specimens displayed a range of markings from single, red genal spots only, to extensive red stripes on the face and vertex with a deep red suffusion. The genitalic morphology of all specimens varied little.

Species collected:

NEUROPTERA: CHRYSOPIDAE.

Apochrysinae

Oligochrysa lutea (Walker, 1853)

Nothochrysinae

Dictyochrysa peterseni Kimmins, 1952

Chrysopinae

Ankylopteryx pallida Banks, 1910

Calochrysa extranea (Esben-Petersen, 1917)

Chrysoperla otalatis (Banks, 1910)

Glenochrysa franzeni Kimmins, 1952

G. opposita (McLachlan, 1863)

Italochrysa fascialis (Banks, 1910)

I. insignis (Walker, 1853)
Mallada albofacialis Winterton (in press)
M. basalis (Walker, 1853)
M. innotata (Walker, 1853)
M. personata (Navás, 1934)
M. signata (Schneider, 1851)
M. traviata (Banks, 1940)
M. tripunctata (McLachlan, 1867)
Plesiochrysa atalotis (Banks, 1910)
P. ramburi (Schneider, 1851)

Numbers of species of Neuroptera collected:
Ascalaphidae (6 spp./4 genera)
Berothidae (1 sp.)
Chrysopidae (18 spp./9 genera)
Hemerobiidae (4 spp./3 genera)
Ithonidae (1 sp.)
Mantispidae (12 spp./5 genera)
Myrmeleontidae (19 spp./10 genera)
Neurorthidae (1 sp.)
Nymphidae (4 spp./4 genera)
Osmylidae (3 spp.)
Psychopsidae (1 sp.)
Sisyridae (1 sp.)

Acknowledgments.

I would like to thank the Australian Entomological Society who partially supported this study. I also thank the following people for their valuable help through collections of specimens during this study: Bob and Jackie Brown (Mutarnee, North Queensland), Jenny Burcher (CSIRO, Long Pocket), Patrick Honan (Townsville), Don Sands and Marc Coombs (CSIRO, Long Pocket), Debra Webster (BSES, Gordonvale), Les Ring (Bluewater, North Queensland).

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AES Research Grant Report

Who brings the Flower Children to Subtropical Rainforest?

1993-94 Research Grant Report on "Pollination in lowland subtropical rainforest" to the Executive, Australian Entomological Society

In Australia, subtropical rainforest communities largely extend from southeast Queensland to northern New South Wales, with spatially isolated outliers to the north and south of this region. However, lowland subtropical rainforest has been extensively cleared since European settlement.

There is considerable floristic and structural variation in lowland subtropical rainforest but three broadly defined subformations dominate. These are littoral, or maritime, rainforests on coastal headlands and hind dune zones, riverine or floodplain rainforests, and narrow riparian forests restricted to stream and riverbanks. Riparian rainforest may be regionally common but littoral rainforests in New South Wales collectively constitute approximately 1300ha and riverine forest, with approximately 100ha remaining in New South Wales, survives as geographically disjunct and structurally degraded remnants of varying size, but commonly <10ha in size.

Rainforest has been the subject of great interest in the public domain over the last two decades and continues to dominate the conservation debate, particularly with respect to clearing and logging in the tropical zones and consequent threats to biodiversity.

Surprisingly, in Australia, although the rainforest battles of the early 1980's elicited heightened public and scientific interest in these communities, we still know very little about the reproductive ecology of individual rainforest plant species, let alone interactions and plant-pollinator relationships at the community level. Thus we cannot accurately gauge the impacts forest fragmentation will have on the survival of individual plants and animals, and whether plant-pollinator relationships can be sustained. At the most basic level we generally don't, or didn't, really have any detailed understanding of what the actual pollination vectors were.

When this project was originally being

considered, few Australian rainforest pollination studies had been undertaken. These existing studies were on individual rainforest plants and principally had addressed species in tropical Queensland rainforests.

No broad studies at the fundamental community level existed for Australian rainforests, although a limited number had been undertaken in Neotropical America and Southeast Asia. However, these were of potentially limited application to Australian rainforests as.the pollinator guilds contained many higher taxa absent from Australia (e.g., hummingbirds, honey creepers, euglossine bees, numerous arboreal vertebrates) or dealt with plant families, such as the Dipterocarpaceae, that are absent here.

With one notable exception *(Eupomatia laurina* - Eupomatiaceae), data on pollination of Australian subtropical rainforest plants were unavailable. Therefore there were few guideposts by which to go when formulating the project, and the relatively large number of plant-pollinator studies undertaken in Australian heathland and woodland communities considered markedly different types of pollination systems so that even basic sampling techniques had to be redesigned or rejected.

"Pollination in lowland subtropical rainforests" is principally a community study, being undertaken in the Manning Valley of northern New South Wales. A broad community study appeared to be a logical starting point (if only to me) since it seemed inappropriate, given the paucity of published information on subtropical rainforests, to pursue a rigorous investigation of single plant-pollinator relationships without being able to position such narrow studies into an understanding or framework of how the wider rainforest community might be generally functioning. Additionally, a broad community study would potentially provide a foundation to facilitate later investigation of more narrowly circumscribed studies of individual community components (e.g., pollination systems in individual forest strata) and species biology (e.g., life history of a particular pollinator).

Many fundamental questions about rainforest pollination can be posed: what are the dominating modes of pollination (e;g.; bird, bat, insect); are pollinators generalists visiting whatever flowers are available at the time, or specialists, visiting single plant taxa or related plants; are plant-pollinator relationships site specific or do pollinators exhibit little fidelity between and within plant populations; are pollinators restricted to rainforest or can they be drawn from wider regional faunas that are present in many vegetation types; and, fundamentally - what are the specific pollinators ?

After several seasons of field sampling, preceded by approximately twelve years of general field observation at the study sites, it would appear that most subtropical rainforest trees and shrubs are pollinated by insects with bird pollination being important for a small subset of trees (e. g. *Grevillea robusta, Castanospermum australe).* Bat pollination, although important in sclerophyllous plant communities, is largely absent, although the specialised blossom bat *Syconycteris australis* roosts in lowland rainforests, but feeds nocturnally from non-rainforest flowers in adjoining vegetation types such as *Banksia* dominated woodland.

Subtropical rainforest trees generally possess open, shallow entomophilous flowers that are coloured white. There are exceptions to this primary theme. The insect pollinators that visit them are dominated by generalist Diptera, Hymenoptera and Coleoptera (>90% at the study sites being less than 6mm in size). Of these, individual orders may dominate at a particular plant at one rainforest formation but may be less abundant on the same flowering plant occurring in a different type of lowland rainforest. Additionally, the composition and abundance of individual insect families and species may be juxtaposed with regards to different rainforest formations, individual sites within single formations and interseasonally. Seasonal weather patterns influence the occurrence of pollinators but the poor knowledge of pollinator biology and physiological constraints on the individual animal precludes meaningful assessment of the cues to seasonal presence and absence of individual taxa.

However, whilst most subtropical rainforest trees are adapted to being pollinated by a broad spectrum of available anthophilous insects several examples of more specialised plant-pollinator relationships are present. Two previously documented cases are that of the fig *(Ficus)*-agaonid wasp and *Eupomatia laurina-Elleschodes* weevil relationship, but others included thrips pollination in *Wilkiea huegeliana* (Monimiaceae), *Maclura cochinchinensis* (Moraceae), *Smilax glyciphylla* (Smilacaceae) and *Rapanea howittiana* (Myrsinaceae), pollination of *Hibiscus splendens* and *H. heterophyllus* (Malvaceae) by nitidulid beetles in the genus *Aethina* and shared

thrips/weevil pollination in the small understorey palm *Linospadix monostachyus* (Arecaceae). In addition, two instances of putative wind pollination, in the vine *Malaisia scandens* and the small tree *Streblus brunonianus* (both Moraceae), were discovered (Williams, G. and Adam, P. [1993], *Biotropica,* 25: 478-480). Wind pollination in Australian rainforest was previously unrecorded.

The presence of, and putative pollination by, thrips loomed increasingly large during the study. Many of these proved to be new genera and species (e.g., *Erythridothrips cubilis*, Mound, L.A. and Marullo, R., [1993], *Ent. scand.* 24: 285-291). Likewise new records for Diptera, Coleoptera and Hymenoptera arose, so that what was begun as essentially an ecological study (with a strong natural history emphasis) generated unforeseen catalytic spin-offs of taxonomic and distribution interest in entomology.

Although small insects (<6mm) dominated the pollinator guild, some larger insects (arbitrarily considered at >9mm) occurred in samples. The ability of small insects to pollinate relatively widely spaced rainforest trees has already been demonstrated and documented by Dr Susan House (ANU), for north Queensland populations of dioecious *Neolitsea dealbata*, *Litsea leefeana* (both Lauraceae) and *Diospyros pentamera* (Ebenaceae). However, the pollination contributions of larger insects remains largely unstudied. Consequently some attention was directed to investigating the role of large insects as pollinators in subtropical rainforest. In part, this involved examination of pollen loads and comparison of the pollen types with that of the flowering plant on which the insect was collected (insects not actually alighting on flowers were omitted).

Several taxa (e.g., Coleoptera - Buprestidae, Cetoniinae; Hymenoptera - Thynninae, Scoliidae, Sphecidae; Diptera - Nemestrinidae) made frequent, relatively long distance inter-plant flights and potentially contribute to out-crossing in spatially disjunct plant populations disproportionately to their low abundance within the overall insect pollinator assemblage (with many small insects, in comparison, contributing to geitonogamous pollination in self-compatible plants).

Bees were recorded from flowers of all ecologically unspecialised entomophilous plant species but the occurrence and abundance of bee taxa and individuals varied between plant species and sites. Generally, bee visitation rates increased with increases in the availability of floral resources but there was no single floral morphology that allowed prediction of high bee diversity (species richness). Flowers which possessed the richest bee fauna included those with open dish-like corollas (e.g., *Waterhousea floribunda* -Myrtaceae) and species with ovaries superior, with free carpels (e.g., *Acradenia euodiiformis* - Rutaceae).

The Colletidae were broadly polylectic in their response to flowering subtropical rainforest trees and the colletid subfamily Euryglossinae were conspicuous flower visitors in riverine and riparian rainforest remnants. Native *Trigona* (Apidae) bees occurred widely on flowers of rainforest trees and shrubs at the study sites, and at adjoining horticultural crops, frequently in consort with large numbers of the introduced apid *Apis mellifera*.

A. mellifera was collected from all flowering tree species except from those whose flowers conformed to the thripophilous, or partially thripophilous floral syndrome (e.g., Wilkiea huegeliana, Linospadix monostachyus). No commercial honey bee hives were located near the study sites and populations were considered to be feral. Response of various native anthophilous insects to the presence of *A. mellifera* varied from no obvious disturbance (e.g., Coleoptera: Scarabaeidae - *Phyllotocus* spp.) to immediate and frequent displacement (e.g., most Apoidea - Hylaeinae).

However, how the presence of foraging *A. mellifera* may affect the reproductive ecology of individual subtropical rainforest tree species (and more broadly, impact at the community and stand level) remains one of the many unaddressed questions in these, still, little understood plant communities.

Geoff WILLIAMS
Lorien Wildlife Refuge,
Lansdowne, via Taree NSW 2430

REGIONAL NEWS

AUSTRALIAN CAPITAL TERRITORY

It is our sad duty to report the death of **Renate Sadler** on 24th July after a long fight with cancer. Renate provided skilled support to Bob Taylor and, latterly, to Peter Cranston and she will be missed by all in the Division. Tributes have come in from

far and wide, and notably from Japan where myrmecologists remember her for all the assistance, well beyond the bounds of duty, giving so willingly. Dipterists too have recounted how much help Renata was able to provide, not least how to make good microscope slides. Bob Taylor provided a moving tribute at the funeral on behalf of all her friends at the Division. Our sympathies are with Renate's two children, Alan Patrick and Lisa.

With a record low of -7°C one morning this week in Canberra, a migration flight north is underway. Though mitey quiet in the Soil Biodiversity Unit, it is probably more than a mite noisier in Columbus, Ohio, site of the IXth International Congress of Acarology in late July. **Bruce Halliday**, **Jürgen Otto**, **Katie Strong** and **Matt Colloff** are in attendance, as is **James Ridsdill-Smith**. Holding the fort back in Canberra is **Ting Kui Qin**, but not for long, as he departs in August in search of red-legged earth mites in South Africa. On their return from acarological tours, they may find their premises revamped, associated with the thorough overhaul of the central part of the building.

I won't be around to drink the champagne for the opening - unless the refit is very much delayed - or to savour the cross-country ski season, since I'm just off to attend conferences of dipterists in Guelph (a bit of southern Ontario pretending to be USA) and of European Entomologists in York (apparently little changed since the Vikings redesigned the city). Some of our work on biodiversity assessment (mainly **John Trueman**'s) and environmental monitoring (mainly **Mick Smith**'s) will get reported if the York pubs aren't too alluring, and in Guelph I'll share some ideas on why a single life-history stage of a holometabolous insect may not provide enough evidence for accurate phylogeny reconstruction. The Hennig meeting in Copenhagen will get a miss, despite the lure of a session on Invertebrate Origins, but **Ebbe Nielsen** and **Marianne Horak** will be there representing austral entomology.

Attempting to dig up fallow wheat fields and bare and dry cotton fields has been a challenge for **Penny Greenslade**, attempting to obtain samples for extraction of tiny beasties from the concrete-like soil. She has also started a small project looking at the effect of fire on ground invertebrates in a cemetery, where the view is hardly more cheerful and nocturnal sampling is to be avoided. Penny too is relieving the stress by heading off to the greener fields of Brittany and Cambridge - let's hope she doesn't provoke a drought there too.

Darryl Gwynne (University of Toronto), in transit from Weta reproductive studies in New Zealand, visited **Dave Rentz** and gave us a splendid seminar on evolution of reproductive behaviour in katydids. This lured several ecological behaviourists from the Division of Botany and Zoology at the Australian National University to traverse the industrial wastelands surrounding the Murray Upton Lecture Theatre. However, the Division of Entomology's non-taxonomists mostly were conspicuous by their behaviourists. Are we satiated with information, too busy trying to meet impossible external deadlines or too narrowly focussed these days? All three, I suspect, each leaving us with little or no time for reflection on the context of our entomological science. Anyway, Darryl completed his sabbatical studies on Kangaroo Island, by finding Lexcen's Vernal Katydid, a species unique in having a "winged keel" structure on the female subgenital plate with unknown functions that Darryl will endeavour to discover.

News (and advertising) from the entomological publishing houses of the world has been flowing in. **Dave Rentz** has completed the manuscript of "Orthopteroid Insects of Australia" and submitted it to the University of New South Wales Press for publication in mid 1995. The book covers four orders: Orthoptera, Blattodea, Mantodea and Phasmatodea, and is written to appeal to students and interested naturalists. Illustrated keys for all groups run at least to the generic level and for certain groups, such as the cylindrachetids and tridactylids, where the majority of the information has been published overseas and in a language other than English, more detail is provided. Details on collecting, preparing and rearing orthopteroids is given as well as some information on their conservation status. The book will be illustrated by nearly 500 of Dave's wonderful colour plates and 148 text figures.

Chapman and Hall signalled their pleasure at the favourable scientific response and seemingly substantial University take-up of **Penny Gullan** and **Peter Cranston**'s textbook "The Insects - an Outline of Entomology" by shipping the page proofs of another book. This time it is the "Chironomidae: Biology and Ecology of Non-biting

Midges", an international, multi-authored review that **Pete Cranston** is writing and editing with two English colleagues. It is due out before the end of this year, at about the same time as the proceedings of January's 12th International Symposium on Chironomidae. CSIRO Publications are handling the latter, under the title "Chironomidae - from Genes to Ecosystems". That there are many more austral contributions in this book than previously is an indication not only of the Canberra location for the meeting, but also the greatly increased interest in these insects in the southern hemisphere.

John Lawrence and **Ev Britton**'s book on Australian beetles is out, and John has been concurrently on two books. he has been bombarding the ether with international email missives about the second beetle text - a commemorative volume for **Roy Crowson** with a multiplicity of authors. One of these authors, **Chris Reid**, promptly departed to take up his Banks Alecto fellowship to do field work in Indonesia after nearly completing his contribution on time. Chris will return to Canberra briefly before starting up his new position with the Cooperative Research Centre for Tropical Rainforest Ecology and Management, based at James Cook University in Townsville.

The publication high point of the quarter was the launch of CSIRO Information Services' and Division of Entomology's CD-ROM "Insects - A World of Diversity" and their taxonomic education kit "Classification - For Senior Secondary Biology". **Barry Jones** launched the products, in the presence of **John Stocker** (our Chief Executive), **Dave Rentz**, **Geoff Clarke**, and **Ian Naumann** from ANIC and many scientific dignitaries in Melbourne Zoo. At the moment only the point and click brigade of Mac users can access the insect sounds, quizzes and 250 colour pictures, but a Windows version is in preparation.

For aspiring interactive key and (perhaps) CD-ROM producers, the DELTA course in May was essential. Another well-received course was organised by **Toni Paine**, **Eric Zurcher** and **Mike Dallwitz**, with hemipterist **Max Day**, odonatologist **John Hawking** (MDFRC) and BCRI's **Peter Gillespie** amongst the enthusiastic converts. **John Trueman** and **Wendy Lee** look likely to get the chance to put their INTKEY experiences to use in preparing an interactive guide to aquatic macroinvertebrates for the growing band of aquatic biomonitors under the aegis of the Healthy Rivers Program of the Federal Government.

The ANIC has recently acquired the collection of Dr **Aola Richards**, of the University of New South Wales, on her retirement. The collection, consisting mostly of Cave and Camel Crickets with a selection of representative species of other related groups from around the world, includes many voucher specimens from Aola's research.

Aside from visiting Melbourne Zoo, with a side-trip to Melbourne University Press, **Ian Naumann**'s duties predominantly have kept him at home, where his diary reveals a steady flow of unit and sectional visitors, including **Harley Rose** (University of Sydney), Professor **Tong Xu Peng** (Guangdong branch, Academica Sinica), **Dave and Betty King** (collectors of Flinders Island Hymenoptera), **Paul Sullivan** from Tamworth (discussing putative control agents for Paterson's Curse), **Jeannie Baker** (seeking insect "characters" for animation), and **Paul Zabrowksi** (to write up CYPLUS). A Canberra meeting of State agencies involved in monitoring aquatic macroinvertebrates allowed **Mick Smith** (now C.A.L.M.) to return to Canberra and start writing up his Honours project for publication, and **Don Edward** (University of Western Australia) took the opportunity to deliver some W.A. wine and make some progress on revising *Riethia* midges with **Pete Cranston**.

Taking a break from her cataloguing of the Australian Blattodea for ABRS, **Alison Roach** is accompanying **Tom Weir** to northern climes, this time to the Northern Territory where Tom is wading in crocodile-infested waters seeking aquatic bugs.

Ebbe Nielsen's travels away from frozen Canberra have taken him at least to Fiji and to Indonesia, where his discussions with **Andy Gillison** on Rain Forest Biodiversity placed him right next to one of **Chris Reid**'s field sites and an impromptu guided tour was organised, including inspection of leopard frass. Ecotourism or biodiversity estimation - is there a difference ?

At the Australian National University, **Penny Gullan** hosted a ten-day visit from **Doug Williams** (now retired from the CAB Institute of Entomology) to study the Australian iceryine margarodids and to talk about Philippine mealybugs with **Jun Lit**. Penny and Doug will continue the iceryine work in England in August. Students **Kendi Davies** and **Brett Melbourne** have started their PhD's, but both are searching still for interesting topics in insect ecology.

Coopers and Cladists moves from strength to strength, including a well-received innovative idea of an periodic discussion of unpublished internal and informal paper - christened and launched by **John Trueman** as "The Homebrew Series". His inaugural jottings were reportedly described by **John Lawrence** as "like being caught inside a PAUP run" - to which I'd add elements of "Alice through the Looking Glass" for the "landscape" of tree-lengths is envisaged as scattered with "mountains" which must be scaled in the search for shorter length trees. Perhaps an improved geographic analogy would be to envisage wandering round in the ocean depths seeking ridges, some of which might rise toward the surface. On the other hand, maybe another Coopers would clear the confusion.....

Peter CRANSTON
Regional Councillor

CSIRO Division of Entomology

There have been many actual and foreshadowed changes in the Division in the last few months, on the surface the most obvious being the massive and continuing refurbishment of administration suites and laboratories in the main building. Glimmers of the final form are now starting to emerge from the hammering and dust... and looking good! Less obvious, but of greater long-term consequence are some notable changes to Entomology staffing.

After 28 years with the Division, and an outstanding career as, as among other things, a world fruit fly expert, **Brian Fletcher** has taken an early "retirement". At one of his several farewells Brian mentioned in passing that he was, in any case, "on the side of the insects" - I suspect that there are many who would sympathise... It hardly needs to be stated that Brian will be missed at the Division, and that his many friends wish him well in his adventures and endeavours ahead. He and Caroline will begin "relaxing" with several months of walking in the Indian hills, before moving to North Queensland, where Brian intends to work with and for tropical birds and butterflies. Brian has already started investigating possibilities in this area, having just completed a trip to Papua New Guinea with **Don Sands**.

Meantime, back at the Mountain, **Joanne Daly** is the new Head of the Pests of Crops and Timber Section. Congratulations Joanne - and to you, too, best wishes for the times ahead!

Other actual or imminent long-term changes at the Division include **Rod Mahon**'s move to Johor, Malaysia, to work on the development and mass-rearing of screw-worm fly, **Leigh Miller**'s impending move to Darwin, where he will spend three years continuing work on *Mastotermes*, and the return of **David Pree** to Canada. On the other side of the ledger, **Bronwyn Campbell** has begun a PhD project on esterase-based insecticide resistance in heliothis, working with **Joanne Daly** and **Robin Gunning**.

Congratulations to the Chief of Division, **Max Whitten** who was awarded an Australia Medal in the Queen's Birthday Honours announced in June. Max has accepted a one year extension of his appointment, which will now run until September 1995. In the past few months Max has been typically busy at home and also abroad, visiting the Montpellier facility in June, and participating in meetings of the FAO/UNEP Panel of Experts on Integrated Pest Control in Rome, the Biotechnology Advisory Commission in Leiden, and the Organising Committee of the International Congress of Entomology in Florence.

As usual, Entomologists have been out and about at scientific meetings and associated visits, with perhaps the "best" effort being mounted by **Roger Farrow**. Roger has been on long service leave and privately visiting Europe for the last couple of months, but has returned to duty to (1) attend the t Biology Symposium of The Committee for Antarctic Research in Venice, where he and **Penny Greenslade** presented a poster on the dispersal and migration of insects on Macquarie Island. He reports that "terrestrial arthropods received scant attention, most of the emphasis going on marine life, presumably because of the likely increase in harvesting in southern waters". (2) Attend a workshop on sustainable management of aridland ecosystems organised by the International Arid Lands Consortium Workshop, held in Jerusalem, and an associated field excursion to the Negev desert to "see 11000 years of degradation first hand, and the Israeli tree planting "savannisation" program using mostly Australian eucalypts and acacias. (3) Present elements of the eucalypt group's research in a seminar at the Oxford School of Forestry.

A large group from the Division (**John Curran, Ray Akhurst, Richard Milner, Jinxian Wang, Steven Trowell, Peter Christian** and **David Dall**) attended the Biopesticide Symposium held at the University

John Stocker, CSIRO Chief Executive, speaking at *Breakfast with the Butterflies* official launch of multimedia CD-ROM, *Insects - a world of diversity* at Melbourne Zoo on 6 July.

Barry Jones, who formally launched the CD-ROM *Insects - a world of diversity* with John Stocker and CSIRO Double Helix Science Club kids learning of insects from the multimedia disk.

of Queensland on June 9 and 10. **Paul Wellings** spent a week of June on an ACIAR-associated visit to Tonga and Fiji, monitoring establishment of the parasitoid *Aphidius colemani* on aphids in bananas, and assessing the status of aphid-borne virus diseases of cucurbits. He reports that he, **Andy Sheppard**, **Rob Floyd**, **Joanne Daly** and **Louise Lawrence** have been busy with the organisation of the A.J. Nicholson Centenary Meeting, for which a final circular is enclosed in this issue.

David DALL
Regional Councillor

University College, University of New South Wales The Australian Defence Force Academy

Alistair Drake's ARC-funded project to develop an Insect-Monitoring Radar is now well underway, with much of the hard work being done by PhD student **Ian Harman**, a Maths Hons graduate from UNE (Armidale).

The prototype radar ran at the Physics Department's field site near Canberra airport during much of January and February, turning itself on automatically at dusk and making observations continually until dawn. The winds the insects were flying in were measured simultaneously with the Department's Doppler Acoustic Wind Profiler which is also installed at this site. Preparations are now advanced for a trial of the radar at Longreach, Qld in collaboration with the Australian Plague Locust Commission. In March, Ian accompanied **David Hunter** on an APLC survey of plague and spur-throated locust populations that extended from Ivanhoe through Birdsville to Burketown.

Much of Alistair's research time over the last year has been spent co-editing (with **Gavin Gatehouse**, Univ. of Wales, Bangor) the book arising from the symposium on insect migration at the 1992 ICE in Beijing. Almost 150 emails have been sent in each direction since this project was conceived! The manuscript finally went off to the publishers in April.

While Ian was surveying locusts, Alistair attended the American Meteorological Society's 11th Conference on Biometeorology and Aerobiology in (cloudy) San Diego, California. He participated in a symposium on the Long-Distance Translation of Airborne Biota and also presented a paper on the Insect-Monitoring Radar. The symposium provided a chance to catch up with four U.S. and British colleagues who spent time in Australia in the 1980s: **Jimmy Raulston**, **Wayne Wolf**, **Stuart Gage**, and **Joe Riley**. En route to San Diego, Alistair called in on **Hugh and Jeri Dingle** in Davis.

Alistair has also made contact with ADFA's other "entomologist", **Peter McIntyre** (Mathematics Department), who continues his research on insect vision in collaboration with colleagues at RSBS. Peter did fieldwork in South Africa and Namibia over the 1993/94 summer.

Alistair DRAKE
ADFA

NEW SOUTH WALES - Metropolitan

Biological & Chemical Research Institute, Rydalmere

Bill Knight, former head of the Hemiptera Section at the Natural History Museum in London spent his first three weeks in Australia in May. Two of these weeks were spent in Sydney, mainly at BCRI but also at the Australian Museum, and a week was spent in Canberra visiting **Max Day** at ANIC. Bill made a brief presentation to the Entomological Society of New South Wales and also visited the preferred site for the 9th International Auchenorrhyncha Congress, to be held in Sydney in 1997.

Murray Fletcher attended the 43rd Annual Conference of the Entomological Society of New Zealand at Auckland University in May to present a paper entitled *An Australian Perspective* to a special full-day symposium on "Entomology for Sustainable Land Use". Murray also visited kiwifruit and avocado plantations and other local agricultural concerns with **David Steven** of HortResearch. Murray also spent a day in the New Zealand Arthropod Collection with **Marie-Claude Larivière**, the Curator of the Hemiptera. At the turnover of the financial year, Murray spent two days in Melbourne, during which he was able to make a lightning visit to IHD at Knoxfield to see **Mali Malipatil**'s new facilities.

Peter Gillespie attended the DELTA course at CSIRO in May and came back glowing with enthusiasm.

A major survey of bee hives using sticky traps was undertaken in May under the supervision of **Danuta Knihinicki** following the alleged interception in Korea of *Varroa jacobsoni* mites in Australian bee exports. The survey found no *Varroa* and the interception is presumed to have been a local

contaminant in Korea.

Gary Levot has been successful in gaining funding to investigate the influence insecticide resistance has on the efficacy of flystrike dressing products, both as larvicides and repellents. **Narelle Sales** will undertake the work with Gary.

Martin Horwood has coordinated the release of almost 5.5 million sterilised fruit flies at Tharbogang, northwest of Griffith in late April. This operation appears to have been completely successful in eradicating *Bactrocera tryoni* from the area as no wild flies have been captured in the area since. Funds have been approved by the Federal Government to establish a "fruit fly factory" to produce sufficient sterile flies to undertake releases aimed at suppressing and/or eradicating Queensland fruit fly from New South Wales, Victoria and South Australia. A Tristate Committee is managing the project. Martin has also gained approval from the Road Traffic Authority to have roadsigns erected around the Griffith region declaring the area a "Fruit Fly Free Zone".

Victor Rajakulendran visited Melbourne in mid June to attend the National Workshop on Diamondback Moth. The workshop was sponsored by RIRDC to bring representatives from each State and others interested in this pest, to plan a coordinated national approach for managing resistance of DBM to pesticides.

Graham Goodyer has started trapping for aphids in chickpea crops to monitor the occurrence of virus vectors in chickpeas, particularly in the north western growing areas.

Jo Wilson of AgResearch, New Zealand, spent nine days with **Andrew Kotze** in May-June to learn biochemical techniques used by Andrew in his work on blowflies.

Barry Wallbank visited Adelaide to attend a meeting of the National Working Party on Grain Protection to review current trials and use of protectants by bulk handling authorities in all States.

CERIT, BIOSCIENCE,
University of New South Wales

For the first time, CERIT staff have run the third year science unit, Entomology. **Chris Orton** and **Jenny Anderson** with **Arthur Woods**, redesigned the course to provide students with a broad introduction to entomology (as much as you can in only 14 weeks!!) Jenny taught the basic systematics and diversity section and Arthur and Chris the insect control sections. The 21 students thoroughly enjoyed the course and some excellent insect collections and other work was produced. CERIT is contracted by the School of Biological Science to teach the course for the next two years, when it will be re-named Insect Diversity and Control.

Chris Orton organised both CERIT Advisory and Management Committee meetings and these were held in May. Future Centre policy direction and planning is worked out at these meetings, which are held annually.

CERIT is stepping up activities in mosquito product testing and developing new protocols to deal with this activity. **Rowena Bower** has been employed to run the mossie work, with money obtained on an ARC grant awarded to **Chris Orton**.

The Entomological Society of New South Wales held its June monthly meeting at CERIT, a change from its regular meeting place at BCRI, Rydalmere. Thirteen visitors inspected the facilities and heard about the mosquito researches of **Rowena Bower** and the buffalo fly investigations of **Jenny Anderson**.

Visitors to CERIT included **Bryan Lett**, **Pat Wood, Gavin Allison** and **Mario Abela** of Reckitt and Colman; **David McCulloch**, CSIRO Chemicals and Polymers; **Alex Newman**, postgraduate University of Adelaide, **David Kingston**, La Trobe Animal Unit; **Barry Brunsdon**, consultant; **Graham Smith** and **Vincent Tan**, Bayer Australia; **Paul Martin**, Pitman Moore; Dr **Laurent Poly**, Roussel Uclaf (France); **Keith Chandler**, the Bureau of Sugar Experimental Stations, Queensland; **Robyn Gunning**, NSW Agriculture, Tamworth; **Joanne Gough**, DTAP, CSIRO, Indooroopilly and **Alistair Drake**, Physics, University College, UNSW ADFA, Canberra.

Australian Museum

Having finally come to grips with some software nightmares, **Geoff Williams** is in the latter stages of writing up his Ph.D. thesis on pollination in lowland subtropical rainforests.

His project has already had some positive catalytic impact providing input into plans of management, field days and workshops to establish rainforest regeneration groups under the National Landcare initiative. Three of these are of particular interest to entomology and conservation biology as the target sites (Hallidays Point, Lansdowne Reserve and Harrington-Crowdy Head)

are remnant rainforests from which insect species have either been described (type localities) or sites possessing a significant number of species representing marked range extensions.

The Harrington-Crowdy Head rainforest was one of the NSW sites nominated for National Estate listing under an Australian Heritage Commission supported project initiated by **Penelope Greenslade**. Both this site, and the Lansdowne Reserve have been the subject of the Australian Museum's Rainforest Terrestrial Invertebrate Program. Geoff has just finished a National Estate nomination for the Lansdowne Reserve, much of the case being based on the invertebrate fauna.

Lou RODGERSON
Regional Councillor

Army Malaria Research Unit
Liverpool Military Area

Bob Cooper, Tony Sweeney and **Darren Waterson** (kindly loaned from the NSW Forestry Commission) recently completed a month of field work in the Gulf Region of Papua New Guinea. Some excellent collections of anopheline mosquitoes were made and sufficient material brought back to keep Bob busy in the lab for the rest of the year. Darren's efforts are to commended having put his life on the line by flying through thunderstorms in fading light to make one last larval collection in a mountainous region north of Kikori, the pilot not impressed with the situation kept mumbling about mountain goats on clouds. Work on the distribution of malaria vectors has recently been extended by applying remote sensing techniques.

Tony has commenced the mammoth task of incorporating our collecting records from more than 600 localities in northern Australia, obtained during field surveys conducted over the last ten years, into geographic information database systems. This involves the use of recently acquired computer hardware and software, and with the use of satellite imagery and other digital GIS information, associations between various geographic parameters and the distribution of *Anopheles* mosquitoes in northern Australia will be studied.

Department of Crop Sciences
University of Sydney

Shane McEvey ran the taxonomy course this last semester while **Fred McDonald** was on long service leave. **Harley Rose** has had several trips to SE Queensland looking for cockroaches. As always he was joined by the redoubtable trio of **Jim Woodward, Andrew Kotze** and **James Walker**. **Joseph Wong** is working with Harley on analysing the effect of ferric chloride on sludge towards a PhD. **Zhongmin Liu** is working on a PhD with **Harley Rose** and **Andrew Beattie** at BCRI on the use of petroleum oils to control citrus leaf miner. **Margaret Humphrey** is studying *Choresoides* spp. spiders for her PhD under the supervision of **Fred McDonald**.

Department of Biological Sciences
University of Sydney

Marianne Frommer, Alfie Meats and **John Sved** have been awarded an ARC grant to work on fruit flies. Marianne and Alfie have also been awarded an HRDC grant to work on improving sterile release in flies.

Rachel Osborn is working with **Marianne Frommer** and **Alfie Meats** on the phylogeny of the *Bactrocera* group. **Victor Rosevearne** is working with Marianne and Alfie on introgressive hybridisation between *B. tryoni* and *B. neohumeralis*. **Geraldene Dolby Bell** is working with Alfie on the host seeking behaviour of *B. tryoni*.

Department of Medical Entomology
University of Sydney at Westmead Hospital

Richard Russell has spent some of the past few months overseas and the rest chained to his desk writing reports and submissions. In May he spent 2 weeks in Iceland with **Gisli Gislason**, looking at blackfly and midge problems associated with trout rivers and lakes, and enjoying the magnificent scenery (not to mention the 'interesting' food). Back home for a few weeks, Richard was involved in a Newcastle workshop and consultancy on constructed wetlands for the Department of Water Resources. Off again to Europe, Richard (with **Stephen Doggett**) attended the International Conference on Lyme Borreliosis to present the results of their 3 years investigation. Richard stayed on in Italy and with **Durland Fish** from New York visited research labs and field sites for Lyme disease in Tuscany. They then moved on to Ireland to spend some time with **Jeremy Gray**, University College Dublin, who is researching ticks and Lyme, and they managed to visit various field sites as well as pubs and ruined castles. Back in

Australia Richard presented a paper on mosquito-borne disease at a Greenhouse update seminar in Newcastle.

Merilyn Geary has been busy with forensic and dog heartworm matters. As mentioned above, **Stephen Doggett** attended the Lyme disease meeting in Bologna, Italy, after which Merilyn joined him and they enjoyed a travelling holiday in Italy, Switzerland and France.

The arbovirus identification previously undertaken at Virology Dept at Prince Henry Hospital has been relocated to Entomology at Westmead and **Michael Cloonan** and **John Haniotis** have joined the Medical Entomology Department to work with **Steve Doggett** and **John Clancy** on our NSW arbovirus surveillance program.

John Clancy has been working on the annual report for the arbovirus program and data for a presentation at the inaugural conference of the Mosquito Control Association of Australia to be held on the Gold Coast in September.

Steven Lindsay has been busy with the Homebush Bay mosquito study, and other investigations for local authorities; he attended the Advanced Mosquito Control Workshop conducted by the Queensland Department of Health and the QUT in Brisbane in June.

John CLANCY
Regional Councillor

NEW SOUTH WALES - Country Areas

Margaret Spencer's book "Malaria - The Australian Experience, 1843-1991" was launched on July 22nd at the Scientific meeting of the Australasian College of Tropical Medicine on - of all places - Daydream Island. Hopefully this note will give knowledge of this book wider currency, medical entomology not being a big component of Australia's entomology.

Woody Horning plans to take voluntary early retirement from the Macleay Museum in October and shift permanently to a property about 25 km SE of Tamworth. Plans have been drawn up for a small research laboratory which will be built probably early next year. He intends to finish some of his Antarctica and subantarctic island projects, work on pseudoscorpions and tardigrades, assist others in their entomological studies where he can and generally enjoy life with his wonderful wife, Darien, and the rest of his family. Until then he has been commuting from Loomberah to Sydney, continuing as Director of the Macleay Museum. The future of the insect collection is still uncertain but a lot of background effort has gone into securing its future. Hopefully Woody can give members of the Society some good news about the collection within the next six months or so.

NSW Agriculture and CSIRO
Australian Cotton Research Institute, Narrabri

Lewis Wilson and **Neil Forrester** travelled recently through the Queensland and northern NSW cotton belt, discussing mites, *Helicoverpa* and the format for next season's Summer Crops Insecticide Resistance Management Strategy. The new Strategy was endorsed at a joint meeting on the 23rd June at the Australian Cotton Research Institute.

Nigel Armes (Research Scientist with the Natural Resources Institute based at ICRISAT, Hyderabad, India) visited **Neil Forrester** at Narrabri after the World Cotton Conference-1, to discuss resistance management of *Helicoverpa armigera*.

As part of a review team, **Michael Pitman** (Chief Scientist to the Prime Minister) visited the ACRI in May to assess the progress of the Cooperative Research Centre for Sustainable Cotton Production.

Norm Thomson, well known cotton plant breeder for the CSIRO Division of Plant Industry based at Narrabri, retired in June. However, Norm will still be seen around the ACRI in his new role as part time retired scientist (without the bureaucracy!) and advisory scientist to Cotton Seed Distributors.

Neil Forrester visited **Peter Gregg** and **Steve Buster** at the University of New England recently, to give a lecture on Insecticide Resistance Management to local entomology students.

Gary Fitt and **Neil Forrester** travelled to St.George recently to speak on transgenic cottons and Bt at the Queensland Crop Management Consultants Association's Annual General Meeting.

Neil Forrester received the 4th Swiss Society of Chemical Industries Award at the Opening Ceremony of the International Union of Pure and Applied Chemistry conference in Washington in July. He then travelled on to Switzerland for lectures in Basle and Zurich.

NSW Agriculture
Agricultural Research & Veterinary Centre, Orange

Visitors to Orange so far this year included two US entomologists: **Don Thompson**, Pacific Biocontrol, Davis, and **Larry Gut**, Washington State University, Wenatchee. Don and Larry presented a seminar in February on aspects of codling moth control in apples and pears in the western USA. The seminar at Orange coincided with a pre-harvest meeting on a major codling moth IPM project attended by entomologists from Queensland, Victoria and Canberra as well as New South Wales.

Graham Thwaite travelled to Melbourne in June to visit **Dave Williams** and **David Eagling** at the Institute for Horticultural Development, Knoxfield. Between them they attempted to overcome a serious obstacle in their resistance project on codling moth - a method of rapidly diagnosing resistance.

NSW Agriculture
Yanco Agricultural Institute

Widespread interest and concern over redlegged earth mites (RLEM) has kept **David James** busy for the past few months, despite the fact that he's officially 'off' this project! The mites themselves have been very late appearing this year due to the continuing dry conditions. However, they are expected to wreak their normal havoc in winter crops and pastures from July to September.

During May David left the RLEM enquiries behind when he made a foray to south-east Queensland to collect assassin bugs (*Pristhesancus plagipennis*) for his research on the aggregation pheromone of this species. He also took the opportunity to visit **Chris Moore** at ARI Yeerongpilly who is collaborating with David on his pheromone research on various bugs and beetles. Chris synthesised the first Australian *Carpophilus* pheromones in April, which performed well in field trials in the MIA. Another breakthrough in *Carpophilus* pheromone research has seen beetle attraction to traps increased by a further four times.

David spent most of July in the USA visiting colleagues/collaborators in California, Illinois and Ohio. A highlight was the attendance at the IX International Congress of Acarology in Columbus, Ohio, where he presented a paper on biological control of mites in Australian viticulture and a poster on *Eupalopsis jamesi*, a newly discovered predator of citrus red scale in the MIA.

Richard FAULDER
Regional Councillor

NORTHERN TERRITORY

DPI&F Entomology Branch

We've been quite the show ponies, having staffed displays at the Katherine Field Day, Berrimah Open Days, Freds Pass Show Day and the International Orchid Display. **Mike Neal** became so moved with the spirit that he tried out his inspired form of entomological evangelism on Grade 1 at Palmerston Christian School.

While **Haidee Brown** adjusts to motherhood, **Madelaine, Ms Lanni Zhang**, originally from Hefei, China, is capably adjusting to plant husbandry and melon thrips research. **Stuart Smith** is still absent - **Shane Griffiths** appears to have shaved his head in protest!

DPI&F Weeds Branch

We tried to keep very quiet about the arrival of our third new biological control agent this year, but still the local Sunday paper got wind of it. A photo appeared of **Colin Wilson**'s nose juxtaposed with a 1mm *Coelocephalapion pigrae* (try saying that with a mouth full of chips!) weevil. The result looked a bit like Edmund Hillary on the summit of Everest as seen from base camp.

Merrilyn Paskins has been going a bit cross-eyed rearing the tiny weevils, and they are either breeding like flies or she's been counting them all twice. **Debbie van Rangelrooy** (try saying that....) has been getting quite frustrated with her mimosa pathogen. It loves agar but isn't so fond of plants. Maybe we all should have listened more attentively during our microbiology lectures, but who can blame us?

Leslee Hills has been spreading her new sida weevil around the countryside with gay abandon. Her old sida leaf beetle stole the show at the Department's recent Open Day. An egg batch started hatching under a microscope linked to a TV set at the beginning of the day, and the last egg hatched right on closing time. Leslee's little monsters were more realistic and scarier than **Steven Spielberg**'s any day!

CSIRO Division of Entomology
Tropical Ecosystems Research Centre

When **Suzanne Gall** was contacted and asked to

fax a *Myrmecia* contribution to the Regional Councillor, she responded "how do I fax money?" In her defence, it was first thing on Friday morning, and she'd probably had a hard week.

ACIAR held its Country Managers' meeting in Darwin during May. **Colin Wilson** (DPI&F) and **Grant Farrell** took the visitors on a whirlwind tour of mimosa infestations. The high (low?) point of the tour was the view of 30,000 ha of mimosa from the newly completed tourist attraction atop Beatrice Hill called "Window on the Wetlands". More appropriate names have been suggested including "Window on the Weedlands" or "Mirror on Mimosa".

The Mimosa Formation Bogging Team has not restricted its activity to Darwin over the last few months. **Mark Lonsdale** has again clocked up the most frequent traveller points. Mark and **Annie Lane** have made several trips to Jabiru as part of a Minesite Rehabilitation Research Program on wet season burning at Ranger Uranium Mine. Mark has also been in Brisbane to discuss a proposed CSIRO Multi-Divisional Program project on export industries for the tropics. As part of this program, Entomology is currently looking at a joint project with Tropical Crops and Pastures on woody weed control. In early June, Mark was also interstate, this time as part of a working group looking into proposed changes to plant importation rules. The idea is to stop the weeds getting here in the first place. The paper that generated this proposed revision will be published in the next issue of *Australian Journal of Ecology*.

The second phase of *Carmenta mimosa* releases began in mid-February and continued into April. At least one generation has passed at most sites and the test of establishment on the Adelaide River will be whether populations can survive the dry season. In late June last year a transect and a series of monitoring sites were set out around a population of *Carmenta* on the Finniss River. These sites were revisited in June this year. The moth was found along the length of the transect and in the first ring of monitoring sites. Some plants near the centre were very heavily infested which, given this insect's chequered history, is encouraging.

The Royal Darwin Show is on next week and as usual TERC will have a stall. The theme will be "Insects and Biodiversity", and **Suzanne Gall** has devoted a lot of time over recent months getting together a display on weed biocontrol. This has been in collaboration with **Colin Beaton** and **John Green** from the Division's headquarters in Canberra, and **Barbie McKaige**, the local Communications Manager. Suzanne now has an impressive selection of photos of the various species thanks to the talents of Colin and John. The scanning EM photos done by Colin are particularly good. If this was not enough to get everybody pumped up, then the long awaited arrival of the automatic seed sorter was. Some may wonder why this is cause for such unbridled joy, but then they have probably never had to hand-sort 320 bags of mimosa litter tray samples. **Annie Lane** hasn't been able to wipe the smile off her face.

CSIRO Division of Entomology
Salvinia Project

The final report of the three year Salvinia Project in Kakadu National Park has been handed to ANCA. Project leader **Mic Julien** visited the Territory recently to discuss the findings with Park staff.

Michael Storrs has been given a three month extension of employment to write a handbook on the biology and control of salvinia.

CSIRO Division of Wildlife and Ecology
Tropical Ecosystems Research Centre

Alan Antpersen will be having movements all over the globe in the coming months. He begins his travels by foraging amongst the morning and afternoon tea tables in Townsville at a Savanna Conference, followed by a brief sortie to Cairns to develop a project on ant biogeography with the Wet Tropics CRC. Then follows a Mining Conference in Darwin. This Darwin conference prevents him seeing Darwin in the way recommended by the Prime Minister, that is from 35,000 feet on the way to Paris. For that is indeed his next destination, to attend the XII Congress of the International Union for the Study of Social Insects, via Sheffield and Oxford Universities in the UK. I wonder if there's an International Union for the Study of Social Entomologists? I offer myself as founding president. Alan then sees Darwin from 35,000 feet on the way from Paris to Alice Springs, although I doubt whether this would be as desirable a way to see it as in the reverse direction.

Professor Rudolf Jander of the University of Kansas visited during July to study orientation in

Oecophylla (green ants). **Paul Bardunias**, a graduate student at the University of Kansas also visited to study the social biology of the termite *Nasutitermes graveolus*. **Cass van der Wood** of the Queensland Forestry Service is visiting to learn how to identify ants, and **Dr Roger Clay** of the University of South Australia will be spending his Sabbatical looking into ants as indicators of grazing impacts, and mangrove ant communities.

Scott Morrison has finished his time with the "ants as bioindicators" project and he is planning an indefinite working holiday in Africa. **Hanna Reichel** has finished her thesis on NT rainforest ants and now looks like getting an opportunity to do some more survey work with the Conservation Commission of the NT. **Lyn Lowe** has successfully completed her first semester back at NTU.

Museum and Art Gallery of the Northern Territory

Paul Brock, a visiting phasmid(ologist) spent a week collecting in the Darwin area, and in Kakadu and Litchfield National Parks, with **Graham Brown** and **Lyn Lowe**. Collecting was relatively poor until Lyn demonstrated the David Rentz method of collecting (see photo below).

Graham also spent a week collecting in the Lake Woods area near Newcastle Waters. This area is very scenic (as is all of the Northern Territory) and is of particular interest because of the variety of soil and vegetation types within close proximity. All the bores on the adjacent properties have cricket names, but not of gryllids, appropriate though they may seem (sorry David). They were presumably named by the owner Mr **Kerry Packer** after better known bores such as **Geoffrey Boycott**, who could dig-in like a mole cricket, and **Merv Hughes**, who has an extremely effective stridulatory apparatus.

A second trip to the caves of Oenpelli resulted in a further six specimens of tailless whip scorpion, including adults at last. Attempts so far to "bring

Lyn Lowe and **Paul Brock** flush phasmids from the undergrowth while **Graham Brown**'s shirt explains the technique

'em back alive" or keep them so beyond 24 hours have been unsuccessful.

Other visitors to the Museum (now officially called the Museum and Art Gallery of the Northern Territory and not to be confused with all Territory Museums managed by the Board which collectively are the Museums and Art Galleries of the Northern Territory) included **Mark Harvey** and **Dennis Matthews**.

Graham Brown gave natural history talks in the Museum's Monsoon Forest aviary during the Museum's Open Day. The aviary had been stocked with butterflies and some expensive birds. Whilst the butterflies performed well during his talks, the birds were not to be seen, and have not been seen since. As the butterfly numbers are also slowly decreasing, one possibility is that there is a hole in the roof, but Public Works seem reluctant to find out.

Department of Health and Community Services
Medical Entomology Branch

Darwin residents can stop scratching themselves for a while as hatches of salt marsh mosquitoes have finally ceased. The Branch is now gearing up for large hatches expected from October onwards when a large series of spring tides is expected.

The Branch is now at full complement with the recruitment of two new technical officers **Barbara Love** and **Lisa Knight**. Both Barbara and Lisa are on a steep learning curve with the identification of mosquitoes, and mosquito monitoring and field surveys. They are tackling their roles with enthusiasm.

The Mount Todd Gold Mine mosquito base line study was completed during the month. The data was gathered over 12 months with the assistance of Zapopan, and the Company is now putting measures in place to reduce mosquitoes and potential problems.

The large base line study of the *Culicoides* of Darwin South has now also been completed and **Peter Whelan** is compiling the report, with **Gwenda Hayes** preparing all the tables and graphs.

Brian Montgomery has just returned after a five week absence including a week in Brisbane at the mosquito control course, and a few weeks reunited with his family who are temporarily in Brisbane where Antoinette is completing her studies.

Visitors included the Mayor of Darwin, **Mr George Brown**, who reviewed the cooperative control program with the Darwin City Council, and **Professor John McKenzie** of the University of WA who discussed the sentinel chicken program and specimens of *Aedes albopictus* from the Cocos Islands.

Colin WILSON
Regional Councillor

NORTH QUEENSLAND

U.S. Dept. Agriculture
Australian Biological Control Laboratory

Staff of the ABCL continued to expatriate Australian insects, both the weevil, *Oxyops vitiosa* and the sawfly, *Lophyrotoma zonalis*, to distant shores (ie: Florida) to supply researchers working with these insects in quarantine. Quarantine research on the *Oxyops* weevil continues to progress well, and the recent appointment of a post-doc to work on the *Lophyrotoma* sawfly in quarantine should also see significant progress made on this potential biocontrol candidate.

In July, **Bruce Taylor** (Department of Primary Industries, Brisbane) visited the Townsville laboratory to discuss plans for an anticipated project to investigate the pathogens that attack *Melaleuca quinquenervia* and its allies. The aim of this research will be to find host-specific pathogens for use as biological control agents against *M. quinquenervia* in Florida, where it is a pest.

QDPI - Mareeba

The entomological contribution to the Cape York Peninsula Land Use Strategy has run its course except for final database entries and analyses. **Pawel Zborowski** spent some time in June at the ANIC tying up loose ends, and has now been lost to an extravaganza of exotic cakes and good wine while he considers his career options. This indulgent behaviour is however, being tempered somewhat by the sobering realisation that he and **Ross Storey** are due to have an insect field guide prepared for Reed Books by next year.

The Mareeba-based IPM project in citrus and papaws has received HRDC funding for a further year, much to the relief of **Jeff Watson** and to the contributing growers who now rely on Jeff's wisdom to combat their entomological problems.

Keith Halfpapp has received the first shipments of *Tetrastichus brontispae* from Guam into quarantine in Brisbane. If all goes to plan it won't be too long before this pupal parasitoid of Palm Leaf Beetle is released in the Cairns area, and

stem the spread of this destructive chrysomelid within the city.

Harry Fay turned part-botanist recently to present a paper at an Australian Systematic Botany Society symposium in Kuranda dedicated to the Origin and Evolution of the Flora of the Monsoon Tropics. His paper dealt with "Evolutionary and taxonomic relationships between fruitpiercing moths and the Menispermaceae".

Ross Storey was off to Victoria, British Columbia, for 6 weeks at the end of July, not as a Commonwealth Games Team supporter but as an ex-Canadian with divided loyalties. He'll meet up with **Henry Howden** to discuss a joint paper they're preparing on Cape York aphodids.

Tropical Public Health - Cairns

David Sinclair resigned from his position as Medical Entomologist in early May and will evidently be taking some time off before deciding what to do career-wise. His replacement in Cairns has yet to be appointed, the position being advertised nationally at the end of June. Meanwhile, **Andrew Van Den Hurk** reports that regular trapping and occasional surveys of mosquitoes are continuing. In contrast to last year, no locally acquired cases of dengue fever have been reported, with just an odd case originating out of S.E. Asia.

Visitors to the Far North

Roger Kitching, Griffith University, headed a party of 14 from Earthwatch on an expedition examining rainforest canopy insects on Mt Haig (northeast of Atherton) in early July. No doubt the wet conditions provided participants with a taste of life in the rainforest and left many unconvinced of the existence of a dry season.

Tropical Weeds Research Centre
Charters Towers

Marie Vitelli left the centre in June on maternity leave. With the baby due in August it was looking like a photofinish between Master's completion and nappy acquisition. We wish her well with both!

Cape Tribulation Tropical Research Centre

Hugh Spencer and **George Wieblen** (Harvard University) are finally writing up the results of the four year cluster fig phenology study of *Ficus variegata*, and are commencing another study on the behaviour of *Ceratosolen appendiculata*, the specific agaoniid pollinator of this fig and its sycophaginid parasites.

Hugh is now acting as the Australian contact for the Association for Tropical Biology. ATB is trying to increase its membership and break out of what is perceived as an excessively "neo-tropical" orientation. To do this, they have to increase their membership outside the neo-tropics and encourage publication in *Biotropica* of research carried out by workers in the rest of the world. Individual subscriptions are $US40.00 plus a $US20.00 impost for airmail. Subscriptions may be paid by VISA/Mastercard and can be routed through Hugh. If there are enough, it may be possible to have *Biotropica* bulk mailed to Australia, saving about $US15.00 per subscription in airmail charges. Those interested contact:

Hugh Spencer
Director of Research
Cape Tribulation Tropical Research Station
PMB 5, Cape Tribulation, 4873
Phone (070) 980068.

Harry FAY
Regional Councillor

S.E. QUEENSLAND

[The editor apologises to Tim Heard, and the SE Queensland Institutes covered by Tim, for the absence of Tim's contribution in the May issue of Myrmecia. *The following report therefore covers the last six months]*

University of Queensland
Entomology Department, St Lucia Campus

The Department has completed the process of selecting a lecturer in systematics to replace **Elizabeth Exley**. Two candidates were short listed: **David Yeates** an ex UQ student most recently from the ANIC, Canberra, and **Terry Wheeler** from the University of Guelph, Ontario, Canada. We were treated to two excellent well presented talks: David talked on "Biosystematic research at work; control and classification in the Diptera" and Terry talked on "Systematics and Zoogeography in the genus *Rachispoda* (Diptera: Sphaeroceridae)" held at the CTPM on the 15 March. **David Yeates** was selected and commenced in early April.

Zhen Changsheng, Katrine Meurant, Michelle Cousineau and **Chris Burwell** have all recently completed their PhDs. Zhen has taken up a sales position with the agricultural chemicals division of

FMC, based in Hong Kong. Katrine's thesis was "A study of the prothoracic gland / corpus allatum / corpus cardiacum ring complex of the Australian sheep blowfly, *Lucilia cuprina*". Michelle's thesis was "Gene flow in the salt marsh mosquito *Aedes vigilax* Skuse". Chris' thesis was "Systematic studies of some Australian Chalcidoidea particularly Eulophidae". Chris has started a 12 month study on the taxonomy of the *Anopheles punctulatus* group of mosquitoes with **Joan Bryan.** The department said goodbye to two other postgrad students. **Deolinda Pacho** returned to Mozambique after completing a M.Ag.St, and **Pearlina Sayaboc** returned to the Philippines after completing a M.Ag.Sc.(Res.). Congratulations also to **Owen Seeman** and **Barbara Gessinger** who have been awarded first class and 2A Honours, respectively.

Three new overseas students are starting postgrad studies within the department. They are: **Ahmad Dahlan** from Haanuddin University, Indonesia who is beginning a PhD and **Swarnalatha Alugadda** (Latha) from Andhra Pradesh Agricultural University, Hyderabad who is beginning a M.Sc.(Qual). The department also welcomes **Huang Kui** from the Beijing Institute of Plant Protection, Chinese Academy of Agricultural Sciences. Huang is enrolled for a M.Agr.Sc. starting 1 May. **Andy Austin** from the Waite campus of the University of Adelaide visited the Qld University Insect Collection to continue his studies on scelionids. **Andres Cokl**, Director of the Institute of the Biological University in Ljubljana, Slovenia was a visitor to the Department between the 14 March and 7 April. Andres has been collaborating with **Gimme Walter** and **Michael Ryan** on sound communication of the Green Vegetable Bug. Preliminary results comparing premating sounds of Slovenian and Australian bugs have shown exciting differences but whether these are great enough to effect recognition by the females is the subject of further study. Visitors to the department during May included **Tony Clarke** and **Kathryn Patterson** from the Centre for Temperate Hardwood Forestry in Hobart and **Walter Rossing**, a plant modeller from the Wageningen Agricultural University, who visited **Myron Zalucki** for talks on plant damage. The department also played host to a contingent of 11 Pakistani entomologists and plant pathologists in early May for a 6 day training course on insect and mite pests of oil seed crops.

Visitors to the department in June and July include **Dave Merrit** from the University of New England and **Gary Dodson** from Bald State University in Indiana. Gary was on his way to PNG to study antler flies in the genus *Phytalmia* and reports the trip was wet but successful. Both Gary and Dave presented very thought provoking talks. **Greg Daniels** recently toured Cape York with wife Alice and **Rod Eastwood**. Greg reports that numerous species of flies previously known only from the Iron Range area were taken on the southern end of McIlwraith Range. Uncommon insects which were collected during the trip included four specimens of the Queensland entomological Society's emblem, *Phalacrognathus muelleri*, coming to light on the Windsor Tablelands and *Chrysops australis* and *Lissimas australis* at Mt Misery and Normanby River. Greg waxed lyrical relating his third ascent of Mt Coen. During previous ascents he noticed increasing lepidopteran activity and on the third ascent the sound of dropping frass was like rain as every plant was being defoliated! Naturally lots of robber flies were also collected during the trip. **David Yeates** and **David Walter** have been busy collecting arthropods in the rainforest canopy near Mt Glorious and Lamington National Park. They report finding a rare, stem feeding, terrestrial chironomid larva probably from the genus *Pseudosmittia*. PhD student, **Michael Ross** collected fruit around Cairns and Darwin in search of parasitoids of fruit flies.

Joan Bryan visited the mine and transmigration settlements near Tembagapura in Irian Jaya during January and the first half of February to study the vectorial importance of a new species of *Anopheles* mosquito suspected of spreading malaria in that region.

Des Foley has returned from a four week trip to the Philippines where he was invited to study malaria vectors with the Research Institute for Tropical Medicine in Metro Manila. Des had a very successful trip but says he will have to learn Tagalog as many people couldn't understand his Australian accent!

Dave Walter has been invited to deliver two papers at the International Congress of Acarology being held in Columbus, Ohio and will be gone for two weeks beginning 13 July.

Myron Zalucki has had a busy time in June/July including a visit to **Craig Maddox** in Alstonville to check on his thesis progress, sitting on the advisory committee meeting for the CRC for

Sustainable Cotton Production at Narrabri in early June and attending the Inaugural International Farming Systems Working Group for pest management of tomatoes and cotton held in Bundaberg on the 16-17 June. Myron also visited the CRC for Temperate Hardwood Forestry in Hobart where he was their "Visiting Scientist".

Ian Yeo, the Accounts Equipment Officer, took early retirement on the 8 July after 37 years. Ian was appointed in Jan 1957 on the recommendation of F.A. Perkins when the department was located in George Street. Ian has served in a variety of capacities including caretaker of the UQIC, many of whose specimens bear his name as collector.

Eric Reye would like it known that his collection of biting midges will be going to **Phil Weinstein** of James Cook University. It was particularly pleasing that the collection remained in Queensland where most of its specimens were collected. After donating her sawfly collection of about 200 specimens to the University of Queensland Insect Collection, **Jan Greg** spent a number of days in July identifying and reorganising the UQIC pergid material. Jan has also been busy collecting pergid larvae and other immatures for the new "Taxonomy of Immature Insects" course to be taught by **David Yeates** in second semester - thanks Jan.

The Department is now connected to the Information Highway. E-Mail addresses are:

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r.ryan@mailbox.uq.oz.au
m.schneider@mailbox.uq.oz.au
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University of Queensland, Gatton Campus

Errol Hassan has been host to many visitors. **Malcolm Ferguson** of DuPont and **Balil Khan** from Pakistan visited Errol to discuss insecticide usage in vegetables and cotton in the l ockyer area. **Sue Heisswolf** from QDPI visited to discuss an experiment on the release of Trichogrammatidae in sweet corn. Three Indonesians, with special interests in agronomy, plant protection, crop and soil science, visited Gatton College for a week, as part of an Indonesian Australia Eastern Universities Program (IAEUP). They spent time with Errol discussing different crop pests, eg crucifers and tomatoes. **Robert Rice** from CSIRO, Canberra, an ex Gatton College student who is doing his PhD on honey bee disease (*Nosema*), visited Errol to discuss future research programs at Gatton College relating to Nosema disease. **Dennis Anderson** from CSIRO, Canberra, visited Errol at Gatton College to discuss future collaborative research projects related to honey bees and visited the College's Apiculture Unit.

QDPI, Agricultural Production, Indooroopilly

Dick Drew and **Annice Lloyd** attended an end of project review of the ACIAR funded fruitfly research in Thailand and Malaysia. The review took place in Bangkok and involved assessment of data from many regions in Thailand and Malaysia, and visits to fruit production areas surrounding Bangkok. Dick and the Fruitfly Group were host to **Carol Quashie-Williams** who is a UN volunteer in Western Samoa on the Regional Fruitfly Project. While on a break from her work on the project she took time to visit the laboratories and look at specimens.

Merv Bengston and **Greg Daglish** have started a new ACIAR project involving CSIRO, QDPI and CTPM. The project which is entitled "The development of decision-support tools for managing pests in grain storages" is being led by **Barry Longstaff** (CSIRO, Canberra). The other Australian collaborators are **Peter Annis** (CSIRO, Canberra), **Geoff Norton** and **John Turner**. Overseas activities will be carried out in Indonesia with Badan Urusan Logistik (BULOG). The 6th International Working Conference on Stored-Product Protection was attended by **Merv Bengston, Pat Collins, Greg Daglish** and **Neil Heather. Chris Bell** and **Paul Cogan** of the UK Central Science Laboratory visited Indooroopilly before the conference, and later about 45 overseas delegates visited the laboratories and the grain terminal at Fisherman Islands before leaving Australia. During February **Mitsuru Katayama** of the Japanese Ministry of Agriculture and Fisheries visited the Fresh Fruit Disinfestation Group at Indooroopilly. His visit was part of a verification trial by **Neil Heather** and **Bob Corcoran** of vapour heat treatment of mangoes. The trial follows several years of research funded by ACIAR, and

should lead to access to the Japanese market.

Pat Collins and **Trevor Lambkin** visited the Torres Strait towards the end of February as part of the on-going spiralling whitefly (*Aleurodicus dispersus*) biological control project. Initial releases of the *Encarsia* sp. parasitoid have been successful in controlling the pest on Boigu Island near the PNG coast.

Brenton Peters and **Ross Wylie** from Queensland Forest Service recently attended a meeting at Eden in NSW where one of the issues discussed was the quarantine threat that Asian Gypsy Moth poses to Australia. Following the meeting a submission was made to the Australian Forest Council regarding this threat, and Ross attended a meeting in New Zealand on the Asian Gypsy Moth. Brenton also attended the 25th Meeting of the International Research Group on Wood Preservation in Bali, Indonesia. CSIRO, Long Pocket Laboratories

Peter Room and **Jim Hanan** attended the First World Cotton Conference in Brisbane in February. They demonstrated "virtual cotton". "No more getting your hands dirty with that real stuff" a certain program leader was heard to say. **Przemislaw** (Przemek for short!) **Pruszinkiewicz** from the University of Calgary, visited Peter for the second time to continue collaboration in simulating plant structural response to insect damage. Meanwhile his ex-student, **Jim Hanan**, now poached by CSIRO, is in Melbourne giving seminars on creating virtual plants.

Marc Coombs has had his first frustrating experience importing a biological control agent into the country. The tachinid parasitoid, *Trichopoda giacomellii*, a natural enemy of Green Vegetable Bug in Argentina, is presently in Quarantine. This parasitoid is mating and ovipositing successfully thanks to the "honeymoon suite" accommodation provided by its thoughtful owners. While **Rose Broe** is taking maternity leave, **Shama Khan** is culturing the green vegie bugs needed for breeding and host testing this parasitoid.

Don Sands held discussions with **Mick Hopkins** (CSIRO Atherton) and **Rhondda Jones** (James Cook University) on possible linkages between the CTPM and the new Centre for Tropical Rainforest Ecology and Management. Relevant projects may include tropical fruit flies, fruit piercing moth and fruit spotting bug. While in the north, Don and **Otto Fahey** found the rare and beautiful fruit piercing moth *Othreis iridescens*. *Neochetina bruchi*, an agent against water hyacinth, has established in PNG. **Warea Orapa**, the PNG coordinator, was in Brisbane to attend the "Biocontrol of tropical weeds" course. He stayed another week to work on other water hyacinth insects with **Mic Julien**.

Michael Storrs is visiting **Mic Julien** in Brisbane to assist in writing the ANCA final report on the salvinia in Kakadu project. Mic has been successful in getting a three month extension for Michael to write a manual on the history and management of salvinia in Kakadu National Park.

Ken Harley went to Uganda to contribute to a FAO training course on aquatic weeds and advise on biological control of water hyacinth in that country. **Tony Wright** and **Wendy Forno** attended the Fourth International Conference on Plant Protection in the Tropics in Malaysia. They will also be holding discussions with future ACIAR collaborators. Both have new ACIAR projects starting there in July 1994 if final approval is attained. Wendy's project concerns biological control of mimosa and Tony's concerns water hyacinth. Wendy hand-carried the mimosa stem-boring moth, *Carmenta mimosa* with her and Tony took *Sameodes albiguttalis* and *Neochetina bruchi* for water hyacinth.

The latest biological control agent against *Mimosa pigra*, the fungal pathogen *Phloeospora mimosa-pigrae*, was released on the Adelaide River floodplains on 14 March. **Ryan Zonneveld**, who is rearing the agent, travelled to Darwin to make the televised release. **Wendy Forno** and **Alan Tomley** (AFRS) checked establishment three weeks later and confirmed that the fungus had completed a generation in the field. Wendy also confirmed localised field establishment near Darwin of a new *Sida* biological control agent, the stem boring weevil *Eutinobothrus* sp. **Wendy Forno** undertook a marathon Latin American expedition. She first visited her Mexican field station to oversee activities, collect insects, check on progress with the second mimosa fungal pathogen etc. She then attended a conference in Brazil in which she was a keynote speaker and session chair. From there she dropped into the isolated mimosa populations in the Amazon near Manaus and on the Orinoco flood plain in Venezuela to collect agents for study in the Brisbane quarantine. There has been much discussion about the future of the Long Pocket Labs. There is a proposal by the host division, Tropical Animal Production, to sell the site and to relocate their staff between the

St Lucia campus and their labs at Rockhampton. Entomology could only remain at the site if the purchaser retained it for research or related activities. Several State departments and a university are understood to be investigating the option of buying the site. The uncertainty is exacerbated by organisational flux in these institutions. The sale of other sites by CSIRO nationally has prompted a Senate enquiry into rural research in Australia. Work at Long Pocket has been interrupted by making submissions to this enquiry and exploring the numerous options for the future. The mood is definitely one of "when will the bastards ever leave us alone and let us get on with our jobs".

Qld Dept of Lands
Alan Fletcher Research Station

Brian Willson visited Indonesia for two weeks in February as part of an ACIAR funded *Chromolaena* biocontrol project. He hand-carried a south American gall fly, *Procecidochares connexa*. **Graham White** also visited Indonesia and the Philippines during early April for the same program. The first agent introduced into Indonesia, an arctiid moth *Pareuchaetes pseudoinsulata* has proven very damaging to *Chromolaena* in the Sci Kopas region of northern Sumatra.

Alan Tomley is having success rearing the rubber vine rust, *Maravalia cryptostegiae*. He has begun field releases of the pathogen in central and northern Queensland using an air shear device which rockets spores over 10 metres into the air! **Mariano Trevino** previously based at the Tropical Weeds Research Centre in Charters Towers began at the Alan Fletcher Research Station in Brisbane in early April.

Graham Donnelly visited Western Australia to inspect a large mesquite infestation near Karratha with **Jon Dodd**, Western Australian Dept of Agriculture. Mesquite is the subject of a joint Queensland Dept of Lands and Western Australian Dept of Agriculture Biological Control Project.

Rachel McFadyen and **Ed Rajotte** (CTPM) travelled to Rolleston, central Queensland, for a *Parthenium* workshop. With the drought over, parthenium weed is now an issue in central Queensland and is attracting media attention. Rachel and **Alan Tomley** are to star on the ABC television program "Landline"! It is hoped the parthenium rust, *Puccinia abrupta*, currently being reared for mass release by **Mariano Trevino** under Alan's supervision, will complement damage from Rachel's insects.

Qld Institute of Medical Research
Mosquito Control Lab

Lynda Muir spent eight weeks in Charters Towers and Townsville evaluating sticky disposable lures designed for *Aedes aegypti* surveillance. She has enthusiastic support from the CT and Townsville city councils, Northern Regional Health Authority and **Bruce Russell** who has commenced an honours project at the Department of Zoology, James Cook University with **Phil Weinstein** and **Brian Kay**. The sticky lure turned out to be a useful research tool. Lynda also surveyed abandoned mine shafts and wells in Charters Towers to determine if they were permanent breeding sites for *Aedes aegypti* which had remained prevalent despite drought conditions. The answer appears to be no and yes respectively. A mark-release-recapture experiment also was successfully undertaken in Pentland to study dispersal over a week. **Craig Jennings** is in Vientiane, Laos, for a follow-up visit to check on the survival of copepods released into wells as a biological control agent for *Aedes* sp., vectors of dengue viruses. Craig is commencing a PhD on the vector competence of mosquitoes for Ross River virus funded through a NH&MRC grant to **Brian Kay** for three years.

Brian Kay participated in discussions on international river basin management with other FAO/WHO/UNEP/UNCHS Panel of Experts on Environmental Management for Vector Control at Aswan, Egypt. He has also been elected to the Queensland Arbovirus Advisory Committee, convened by Queensland Health. Brian and **Mark Hearnden** attended a conference on dengue vector control in the urban environment in Taiwan. The meeting is being sponsored by the Republic of China and the Rockefeller Foundation and is aimed at forming a new alliance in Asia to help rejuvenate dengue vector control programs globally. Brian will present a paper titled "Intersectoral Approaches to Dengue Vector Control". From Taipei Brian will visit Bangkok and Laos before returning to Oz on 5 June. **Ian Fanning** has returned as a consultant to a new project isolating arboviruses from mosquitoes collected by **Scott Ritchie** and a team of local authority collaborators. The viruses of interest are Ross River and Barmah Forest, both public health

problems last summer in Queensland. Although *Culex annulirostris* and *Aedes vigilax* are known vectors, this project aims to define all the suburban vectors involved in transmission.

Queensland Museum

Geoff Monteith & **Heather Janetski** went to Perth in early March to run Insect Workshops at the SCITECH Discovery Centre in conjunction with the opening there of the giant robotic invertebrate display "Gargantuans From The Garden". The exercise was very successful with 120 teachers enrolling for the sessions and Heather & Geoff had an opportunity to see Gargantuans in action in readiness for the exhibitions season at the Queensland Museum, which commenced 20 June. Geoff has also just returned from a 2 week trip to New Zealand where he organised the opening there of the 15 month tour of the Butterfly Man of Kuranda travelling exhibition which was very well received. Geoff fell in love with New Zealand Wetas when he had some opportunity to get into the field.

Robert Raven led an arachnological contingent to Beerwah in search of the rare and beautiful crab spider *Phrynarachne* which is believed to spin scented silk to attract its insect meal. Within 15 minutes of arriving **Jan Green** and **Tracey Churchill** scooped the pool and found the first female on her egg sac. **Maureen Glover** bought a team of volunteers and despite the rain the spider activity was delightfully furious and fresh! PhD Student **Paul Grostal** (UQ, Entomology) also accompanied the group and got his first taste of Queensland's arachnofauna. The whole wonderful event was recorded by a Totally Wild crew which seems to have discovered a fountain of interesting events occur each day in museums!

Phil Lawless and **Matthew Shaw** have set out with **Janet Sutcliffe** to retrieve the pitfall traps set in the Eungella Ranges late last year as part of an ANZSES EXPEDITION.

In commemoration of International Museum's Week (May 16-22), the Entomology and Arachnology sections took their work area onto the public floor. **Geoff Monteith** and **Geoff Thompson** dazzled the excited public with the microscope setup on a video screen. Geoff T. also made a brilliant demonstration of the tremendous patience and skills required to make entomological illustrations of quality. **Robert Raven** and **Phil Lawless** identified spiders and worked on research topics. All fielded diverse questions from an interested public delighted to discover the rich depth of scientific knowledge held by museum staff and how ready the staff were to be disturbed. A great and useful week all around. Preparations begin for Gargantuans of the Garden exhibition coming soon.

Ted Dahms has moved from the museum to the Auditor General's Department.

Griffith University

Norman Fashing from the College of William and Mary, Williamsburg, Virginia, was based at Griffith University for a short time while collaborating with **Dave Walter** (Uni of Qld) and **Roger Kitching** on mites in tree holes. Dave and Norman have already visited Lamington National Park in pursuit of these tree hole dwellers.

Cooperative Research Centre for Tropical Pest Management

The Centre was reviewed in mid-April to establish "What happens..??" after June 1996 - which is the current life of CTPM. So while everyone was busy preparing, writing (and ultimately presenting) for the Review, the science and the stream of visitors continued.

Highlights included the Launch of DIAGNOSIS for Crop Protection - computer assisted learning software for student/consultants in crop protection. The Launch was attended by **Llew Edwards** and included an enthusiastic speech from the softwares originator **Terry Stewart**, Massey University, New Zealand. DIAGNOSIS is now for sale and anyone interested should contact **Bryce Skarratt** (07-3651574). Visitors to CTPM have included **Andrj Cokl**, a neurophysiologist from the Institute of Biology, University of Ljubjana, Yugoslavia, **Marjorie Hoy**, Dept of Entomology & Nematology, University of Florida, Gainesville and **Graham Matthews** of Imperial College UK. (But if you missed them...well its too late!). Visitors over the next few months will include **Dr Heong** from IRRI and **Trevor Jackson**, AgResearch NZ - lookout for seminars.

Congratulations to **Rachel McFadyen** (QDL), **Wendy Forno** (CSIRO) and all of the other key people involved in the highly successful international training course on "Biocontrol of Tropical Weeds". Held in March, this course attracted participants from all over SE Asia, and with another course already scheduled for March

1995 this is looking like an annual event!

Congratulations also to **Michael Yare** who planned, wrote, created and "manned" the CTPM software display at the Horticulture Expo at Gatton, May 25-26. The principle software was WinCITRUS - which uses the new QDPI Agrilink manuals and provides a multimedia information source for growers/consultants. The latest version of Tropical Pest News has just hit the streets (TPN is the 6 monthly news journal produced by the Centre). If you would like to receive a copy of TPN (and don't usually!), or would like any other info on CTPM please contact **Paula Myatt** (07-3651878).

United States Dept of Agriculture
Australian Biological Control Lab

The USDA ABCL has submitted a request to export the *Melaleuca* psyllid to quarantine facilities in the USA. A copy of the request was included in the January-March quarterly report. **Jenny Somes**, an undergraduate student from the University of Queensland, is working part-time for the ABCL in Brisbane at the CSIRO Long Pocket Laboratories.

Tim HEARD
Regional Councillor

QDPI Plant Protection, Toowoomba

Toowoomba's ranks will be reduced over the next month. **Brad Scholz, Richard Lloyd, Bernie Franzmann** and **David Murray** will be attending the 7th Australian Cotton Conference at Broadbeach in August. August will also see **Richard Lloyd, Bernie Franzmann** and **Gordon Simpson** visiting Broadbeach for the 1994 Biennial Sunflower Conference.

QDPI Plant Protection, Applethorpe

Frank Page attended a meeting in Canberra to discuss the progress and next season's work in an IPM project involving mating disruption in Codling Moth. **Frank** is also testing bait sprays to control fruit flies in apples, and visited **Dick Drew** (QDPI, Indooroopilly) to discuss the work.

A meeting of 45 growers at Applethorpe heard **Frank** discuss the problem of mirids in stone fruit. **Frank** says that mirids are alive and well despite the Granite Belt's frosty weather and years' long drought.

Apple dimpling bugs may be a problem for growers in the coming season. **Frank Page** reports that he has found them on non-flowering wattles at Millmerran, Aratula and Warwick.

QDPI Plant Protection, Bundaberg

Visitors to Bundaberg for the first meeting of the Integrated Farming Systems Group in mid-June included **Myron Zalucki, David Murray, Gary Fitt** and **Lewis Wilson.**

BSES, Bundaberg

Trevor Jackson, Lincoln, New Zealand, visited **Peter Allsopp** and **Peter Samson** in Bundaberg for discussions about white grubs and especially about the success of **Invade**, a bacterial insecticide for the control of NZ grass grub.

Trevor later participated in a review of the potential usefulness of ***Metarhizium*** for cane pest control. Also present were **Peter Allsopp, Peter Samson, Les Robertson** and **Keith Chandler** from BSES, **Richard Milner** (CSIRO), **Dave Holdom** and **John Rogers** (CTPM) and **David Pulsford** (Bio-Care).

BSES is about to welcome **Peter Walker** back to Australia. Peter is swapping the cold unemployment of England for the warm (not only temperature!) employment of north Queensland. He will work on the biology and control of greyback canegrubs, particularly in the Burdekin area and will be stationed at Ayr.

Gordon SIMPSON
Regional Councillor

SOUTH AUSTRALIA

Department of Crop Protection
University of Adelaide

The organising committee of the forthcoming 25th AGM and Conference are up to their eyeballs in registration forms, abstracts and discs, with quite a few late-comers still filtering through (always with the late fee, naturally). To date, the number of delegates is around 150, so all is on track for a successful event. The department is full of bleary-eyed people, either from the recent World Cup Soccer Tournament or from jet-lag (or in some cases, both!). **Jörg Kitt** has returned from a six week trip collecting *Aphidius rosae* in Europe. He visited universities in Naples, Wageningen, Kiel and Hanover, where he discussed wasp behaviour, biological control, and the inevitable soccer results.

In May, **Scott Field** departed for the Middle East and Europe on a five week vocational/ cultural exchange organised and funded by Rotary International. In Israel, he visited the Institute of

Plant Protection at Bet Dagan, meeting with several members of the entomological research team and discussing their IPM strategies for cotton which are largely based on Australian models. Other research at the Institute includes studies on physiological aspects of encapsulation, biological control using *Bacillus thuringiensis*, biology of *Aphytis* species, and management of pine beetles. At the Faculty of Agriculture of the Hebrew University of Jerusalem in Rehovot, he met **David Rosen** and some postgraduate students in the Department of Entomology whose research reflect the national drive towards reducing pesticide use through more efficient biological control. In the Netherlands, he met with several groups working on ecological modelling of parasitoid behaviour. At Wageningen Agricultural University he visited **Nicky Agelopoulos** in the Department of Entomology, and **Lia Hemerik** in the Department of Mathematics. He also visited **Marcel Visser** at the Netherlands Institute of Ecology, and **Jacques van Alphen** at the Department of Population Biology, University of Leiden. The trip was rounded off with a visit to **Charles Godfray**'s group at Imperial College, Silwood Park, in England.

Eveline Bartowsky has also returned from a sunny sojourn to the Solomon Islands feeling relaxed and ready to face the chill of winter. **Bill Frost** is attending the 1994 Summer Acarology Program at the Ohio State University. In late July, he is presenting a paper at the IX International Congress of Acarology in Columbus, Ohio. Following the Congress, he will visit West Virginia University where he will be studying the taxonomy of *Aceria* species occurring on wheat in Australia and the USA in collaboration with **Jim Armine** of W.V.U. **Mark Dowton** has left the department to take up a prestigious Fellowship at St. Vincent's Institute for Medical Research. Mark was a Postdoctoral Fellow working on **Andy Austin**'s ARC funded project on the molecular systematics of wasps. In his place, the department has appointed **Natalie Dillon** as Research Officer to sequence wasp DNA for phylogenetic studies. **Chris Madden** has joined the State Water Laboratory of the E&WS Department as a Research Scientist, while still frantically writing up his PhD. He is working on the "Monitoring River Health Initiative" funded by the Commonwealth Environmental Protection Authority.

Mike Keller's lab is in a constant state of change. Out with **Sharyn Foulis** who has submitted her Honours thesis entitled, "The effects of host and non-host chemicals on the ovipositional behaviour of the lucerne seed wasp, *Bruchophagus roddi*", and who received a First Class Honours for her trouble. In with **Latif Salehi**, a new PhD student who will be working on the efficiency of parasitoids of potato moth.

Primary Industries

Peter Allen has recently taken up the position of Program Manager for the Animal and Plant Control Commission, which is a statutory authority administered within Primary Industries, S.A.. The Commission is involved in developing pest management strategies for the control of vertebrate pests and plants, including biological control with insects. He looks forward to facilitating ecological studies with pests and to the Commission's move to the Waite Campus in early June.

South Australian Museum

It is with great sadness that we report the death of **David C. Lee** on 13th June 1994, from cancer. David was a quiet and unassuming scientist who had a great dedication for the study of mite taxonomy and soil biology in general. He has authored many taxonomic papers and was well known by international mite workers and, more locally, by natural historians in South Australia.

In April, **Gordon Gross**, along with three other people from the Museum and Flinders University, visited the Serpentine Lakes area of the Great Victoria Desert, partly to search for an unnamed hemipteran possibly representing a new family, which is known only from that area and a mallee area in Western Australia. On the last day, ten specimens of this insect were found under the bark of eucalypts. The catalogue of Australian and Pacific Islands Heteropteroidea being prepared by **Gordon Gross** is now completed in first draft for the Coleorrhyncha, Enicocephalomorpha, Dipsocoromorpha, Gerromorpha and Nepomorpha. Work is now proceeding on the Cimicomorpha with the first draft printed out for the Naboidea, and is well advanced on Anthocoridae and Tingidae. Work completed to date can be obtained on either 5 1/4" or 3 1/2" disc by writing to the author. In

most cases a small transcription fee will be charged which will go into the South Australian Museum Research Fund, plus the cost of the disc if not provided by the recipient. Among visitors to the Museum was **Kevin Richards** of the Western Australia Department of Agriculture, who dropped in on May 2nd with his wife.

Private Entomology Sector

News from **James DeBarro** of Crop Monitoring Services is that June saw the release of the "Success with dryland lucerne" manual which was co-authored by C.M.S. staff along with **Mark Stanley** of the D.P.I.. Orders for the manual are being received from across Australia and results should see increased sowing of lucerne. If anyone wishes to know more about the lucerne manual, or would like to order a copy, contact James on (087) 55 1295. The season in the south-east is progressing steadily, although the recent lack of rainfall in late June/early July has seen paddock feed growth slow up. Pest activity is very low except for early activity of red-legged earth mite. C.M.S. staff will attend the National Landcare Conference in Naracoorte in July, conducting workshops for monitoring in a sustainable agriculture.

Mosquito Research Group
University of South Australia

The Mosquito Research Group continues its work, but with dwindling personnel. **Prof Mead** is translocating his research to a newly-constructed laboratory at his house. **Grant Fleming** has submitted his thesis and is now working in Melbourne. **Lawrie Bennett** continues to focus on mosquito larvae as bioassay animals. That leaves **Mike Kokkinn** pottering away on his two topics: temperature conditioning and development of "quinks" larvae and olfactory taxes of *Culex annulirostris*. Mike has put in two applications for Australian Postgraduate Awards linked to industry. The first is in collaboration with the S.A. Health Commission and the second in collaboration with Berrivale and the Berri Council

Other regular contributors for South Australia were absent before the deadline, so we look forward to hearing about their travels for the next issue.

Lynne GRBIN
for Bill FROST
Regional Councillor

TASMANIA

WANTED

Invertebrate locality records for Tasmania

Have you collected terrestrial or freshwater invertebrates in Tasmania since 1970? If you have we would like to hear from you as soon as possible.

On behalf of the Australian Heritage Commission we are collating and mapping all available high quality locality information on Tasmanian non-marine invertebrates. The aim is to summarise information at different levels of content from a general level (where have collectors of different taxonomic groups been?) to the specific (where has each named species been found?)

All information that we accept will be coded to indicate the wishes of the provider on confidentiality, this will be diligently respected. Data will be routinely plotted on the scale of ten kilometre grid squares only, no greater details will be released for any record without the written consent of the data owner.

All contributors will, of course, be acknowledged in our report - this section is already shaping up to be a Who's Who of invertebrate specialists!

For more information and contributions please contact either:

Project Officer	or	**Project Leader**
Dr Bob Mesibov		Dr Tim Kingston
PO Box 700		Queen Victoria Museum
Burnie		Wellington St
TAS 7320		Launceston
		TAS 7250
Ph: (004) 313428		(003) 316777
Fax: -		(003) 371117

VICTORIA

Department of Agriculture
Institute for Horticultural Development

A National RIRDC Workshop on insecticide resistance in diamondback moth, hosted by **Peter Ridland** and **Nancy Endersby** of IHD Knoxfield, was held in Melbourne on the 15th and 16th of June. Seventeen participants, from Victoria, NSW, ACT, SA, Queensland and Tasmania, were in attendance. The discussion was facilitated by **Elaine Brough** (CTPM) and action plans for a coordinated approach to resistance management, research and extension were generated. After the workshop, **Sue Heisswolf, Lionel Hill, Mike Keller** and **John Hargreaves** visited IHD for the compulsory "new institute tour" and to discuss *Plutella*, *Trichogramma*, potato moth, etc.

Murray Fletcher made a lightning visit to IHD in June, to catch up with **Mali Malipatil** and discover the Institute.

In May, **Paul Horne** attended a workshop in Brisbane, talking about potato moth in potatoes and tomatoes. He also attended the National Potato Industry Conference in Adelaide during July. Paul and **Andrew Henderson**, with assistance from entomologists in WA (**Stewart Learmonth**), Queensland (**Iain Kay**), SA (**Greg Baker**) and Tasmania (**Lionel Hill**), are conducting a survey of parasitoid wasps in potato crops around Australia. After rearing through potato moths and their parasitoids from leaf samples, they are starting to get a good idea of just what is where. Paul and Andrew are also preparing extension material on the potato moth and other insects of potato crops, as well as conducting a mail survey of potato growers in other States to determine attitudes to insecticides and awareness of IPM. This survey was one of many topics of discussion with **Mark Walton** (CTPM), who visited IHD in June and compared the work on potato moth in Victorian potatoes with that in Queensland tomatoes.

Andrew HENDERSON and Alan YEN
Regional Councillors

WESTERN AUSTRALIA

W.A. Department of Agriculture

Francoise Berlandier has obtained funds from HRDC and both Crop Care and Bayer to produce 2 commercial posters on the identification of pests and diseases of cucurbits and tomatoes in WA, with particular emphasis on the Carnarvon area. The GRDC funded cockchafer project has ended after 4 years of research into the biology and control of the pest. While **Rob Emery** writes the final report on cockchafers, he and **Ian Dadour** are starting a new GRDC funded project on the biology and identification of native and pest *Trogoderma* species. **Andras Szito** will more than likely be providing technical support to this program. Andras has enrolled in a Masters degree at Curtin University working on the taxonomy of *Trogoderma* under the supervision of Assoc Prof **Jonathon Majer**.

Rob Emery attended the 6th International Working Conference on Stored Product Protection in Canberra in April where he presented a poster on the GRDC funded project entitled "A Western Australian Farm Survey for Phosphine Resistant Grain Beetles" and, in collaboration with **Francis De Lima**, the RIRDC funded project "Improved Procedures For Fumigation of Oaten Hay in Shipping Containers". In addition, **Rob Emery** attended the Australian Wheat Board's Working Party on Grain Protection in Adelaide in June where he presented results of the phosphine resistance surveys and discussed resistance management strategies, which will enhance WA's ability to export residue-free grain.

As part of a Healthway's grant, **Ian Dadour** visited 2 Aboriginal communities (Coonaanna and Tjuntjunjara) in the eastern Goldfields. Bush flies will be trapped at these sites in search of a link between the debilitating eye disease trachoma and the bush fly. Two other communities are being selected between Derby and Fitzroy Crossing. All communities are located in pastoral (cattle) areas. Bush flies are being trapped for 2 years in each community after which dung beetles will be released into and around the communities. Hopefully, this project will result in a reduction in both bush flies and trachoma.

Curtin University of Technology

Jonathon Majer is expecting Assoc. Prof. **Harry Recher** from University of New England to help write up papers on their joint arboreal arthropod project. The two have also prepared a paper for the forthcoming Greening Australia conference which has the theme of a "Vision for a Greener City". This paper lays down some guidelines for encouraging insects, birds and other wildlife into urban areas. Jonathon will be attending the

conference of the International Union for the Study of Social Insects this August in Paris. As an invited speaker, Jonathon will address the Hymenoptera Biodiversity Symposium on a new way for measuring the "quality of biodiversity" using ants as an example.

University of Western Australia

Professor **John Alcock** will be returning to the department in July/August, to work on Mason's Burrowing Bees until December. **Andrew Mason** (University of Toronto) is working with Assoc. Prof. **Win Bailey** on auditory mismatching in some tettigoniids near Albany from October to November. **Larry Field** (Canterbury, New Zealand) is spending part of his sabbatical with Win in November to December to work on stenopelmatids and gryllacridid hearing systems.

CSIRO

James Ridsdill-Smith is attending the IX International Congress of Acarology in Columbus, Ohio from July 17 July, then travelling on to Holland to visit fellow mite researchers. **Sergio Marshall**, a technician for **Ron Prestidge** at AgResearch's Ruakura Research Centre, Hamilton, New Zealand, is working with James for 5 weeks on plant resistance factors to mites. Earlier in the year **Celia Brown** from James' group spent several weeks at Hamilton working with the pasture group there as part of the technical exchange program.

John Scott visited Israel in March to collect *Apion miniatum* and *Coniocleonus excoriatus*, two curculionid weevils for the biocontrol of doublegee. The insects are currently in quarantine at DAWA, South Perth.

David COOK
Regional Councillor

CARABID WORKERS!
PLEASE NOTE!
André Larochelle
is closer than you may think!

André, who has published extensively on the carabid fauna of America North of Mexico, is now living in Auckland and working as a research associate of the New Zealand Arthropod Collection (NZAC) at the Mount Albert Research Centre. He is keen to establish close contact with Australian workers on Carabidae and can be contacted at NZAC by post (c/- Landcare Research, Private Bag 921 70, Auckland, New Zealand), by phone (+64 9 849 3660, extn 6211) or by Fax (+64 9 849 7093).

OVERSEAS NEWS

NEW ZEALAND

Entomological Society of New Zealand
43rd Annual Conference

Highlight of the year for Auckland entomologists was the Entomological Society Conference held at Auckland University this year. The organising committee were all Auckland Branch members, and worked very well together as a team for a very smooth-running conference. It was very successful,with more than 75 people registering for the different sessions. The papers presented were of a high standard, and notably well presented were those of the students (mainly from Massey, Canterbury and Lincoln Universities) who shared the results of their research topics.

The all-day symposium on "Entomology for Sustainable Land Use", was in two parts: 1. "Primary Production", and 2. "The Natural Environment". Papers of the symposium and abstracts of contributed papers and some of the posters, have been published in the Proceedings. The Society intends to publish the symposium as a bulletin to reach a wider audience.

The pre-conference field trip to Tiritiri Matangi Island off the coast of the Whangapaoroa Peninsula, north of Auckland, was a great day, with a record of 83 people attending. Usually pre-conference field trips have up to 20 people. Thanks are due to **Chris Green** for organising the trip (and a fine day!), and special thanks to those Auckland Branch members who billeted out-of-town entomologists the night before, to enable them to go on the trip.

The wine and cheese evening, organised by the Auckland Branch committee, had about 60 people attend, and the posters made it well worth while. The displays (mostly photographic) were of

extremely high standard again this year, on a variety of topics.

Sixty people attended the Conference Dinner at Old Government House in the Auckland University grounds, and this provided an excellent venue for chatting with colleagues and catching up with old friends over a delicious meal and very fine wines.

Olwyn R. GREEN
Entomological Society of New Zealand
for John TENQUIST
Overseas Correspondent (NZ)

PAPUA NEW GUINEA

Lastus Kuniata, now Senior Agronomist at Ramu Sugar Ltd, reports that the psyllid, *Heteropsylla spinulosa*, imported from Queensland in 1992 against the giant weed *Mimosa invisa*, is now widespread in Ramu and Markham Valleys. The psyllid has been found to reduce seed production in the noxious weed by up to 90%.

Don Sands and **Mark Coombs** from CSIRO Brisbane paid a two week visit to PNG in mid July. The scientists visited **Fred Dori** at Laloki as well as *Nezara viridula* infestations in Lae and adjoining areas. The fly *Trichopoda*, imported from Australia, is currently undergoing Quarantine trials before release against the green vegetable bug.

Prof. V.K. Gupta, the well known hymenopteran taxonomist from the University of Florida, is visiting PNG for two weeks from 9th to 25th August. He will be based at the Agriculture Department of the University of Technology, Lae. During this period he will give lectures to final year students and deliver seminars to the Faculty. He will also visit other institutions of entomological interest.

Ray KUMAR
Overseas Correspondent (PNG)

NEWS FROM AFFILIATED SOCIETIES

Entomological Society of New South Wales Inc.

The May meeting of the Entomological Society of NSW was addressed by **Bob Ryan**, whose topic was "Phosfume™ - the latest in fumigation - an environmentally friendly alternative". Bob has been working for CIG since 1967, where he developed an internationally patented technique for using liquid CO_2 as both solvent and propellant for insecticides. His cheerful and entertaining presentation of his topic made it very interesting for all those present.

The Society changed venue for the June meeting to Centre for Entomological Research and Insecticide Technology (CERIT), University of NSW, Randwick. Members and visitors were shown around the CERIT laboratories located in converted tram sheds (recycled nests of the now extinct Bondi Tram). Two of the staff described their current projects. These were "Culturing the Buffalo fly, *Haematobia exigua*" by **Jenny Anderson** and ""Mosquitoes and me" by **Rowena Bower.**

Stephen Fellenberg addressed the July meeting on "Australian phasmatids - stick insects galore". Stephen has been interested in phasmatids for several years, having up to 150 in one cage. He brought live specimens, including *Eurycnema goliath*, which was passed around; it was one of the most popular exhibits at any of our meetings. The members and visitors enjoyed his presentation and his display of both live and pinned specimens.

Alan CLIFT
Representative Councillor

Entomological Society of Queensland Inc.

The meeting in May was addressed by **Ed. Rajotte**, Associate Professor of Entomology at Penn State University. His topic was "Managing the Tufted Apple Bud Moth in Pennsylvania Apple Orchards - Dispersal and Insecticide Resistance". Ed is currently on sabbatical leave at the CRC for Tropical Pest Management, University of Queensland.

Gudrun Sarne died on May 7th and the President expressed sympathy on behalf of the Society. Gudrun had been an active member of the Ento. Soc. Qld for many years and she will be greatly missed.

The June meeting, as always, was Notes and Exhibits. **Chris Monsour** was the winner of this year's Student Award, for a thesis entitled "An investigation of the potential of a nuclear polyhedrosis virus for the control of tobacco looper." After receiving his prize he described the project. **David Yeates** brought in a scorpion fly larva, *Harpobittacus* sp. (Mecoptera), collected in a Brisbane suburb. Two postgraduate students from Malaysia, **S. Vijaysegaran** and **Mohd Shamsudin Osman**, talked about entomology in Malaysia and lepidopteran and other fruit borers of durian, *Durio zibethina*. **Christopher Hocking** has developed a new way of mounting insects and

other arthropods so that dorsal and ventral surfaces are on view without disturbing the specimen. He brought in some beautiful examples of his work. It was a varied, interesting and entertaining evening. Unfortunately (or fortunately, depending on your nose and taste buds) there were no samples of durian included in the supper.

Judy KING
Representative Councillor

ELECTRONIC NEWS

I am keen to establish a section in Myrmecia to provide details of entomological information available through internet or other electronic means. Members who have information available on electronic networks and wish to advertise this availability may do so via this section. Please include instructions for gaining access to the data - remember, we're not all expert users!

Insects as a cause of inhalant allergies

The annotated bibliography with the above title (Bellas, 1982) has been out-of-print for some time. An enlarged and more current bibliography has been installed as a database on the computer at the Division of Entomology and access to the bibliography is available through AARNet (or INTERNET).

There are two ways of obtaining access to the bibliography:

1. if you have a "gopher" system then you should be able to gain access to the Division's gopher server by
   a) entering *gopher spider.ento.csiro.au* or
   b) from a Windows gopher, finding the title "Australian Gophers". Look for "CSIRO ITS Branch Information Server" and continue along the path shown below.
2. if there is no gopher system but you are able to gain access to other computers by using "telnet" then a more circuitous route is available.

   Enter *telnet info.anu.edu.au*

   At the first choice screen enter "info" which gains entry into the gopher of the Australian National University. To transfer to the Division's gopher follow this path through the menus
   Australian Networked Information Servers
   CSIRO ITS Branch Information Server
   CSIRO Gophers
   Division of Entomology
   Inhalant Allergy to Insects Database

The database can be searched for any complete word so that searches can be made for the type of insect, the names of authors, specific names etc. The separate species index lists all those insects that have been mentioned in the literature but not all of the species have been the cause of allergies.

At this date the bibliography covers the literature to 1987 and contains 627 references. As time permits more recent references will be added and these already are more than 160.

If there are problems in gaining access to the bibliography or any questions about the database or its contents contact Tom Bellas by fax or email:

FAX (61) 6 246 4000
EMAIL tomb@ento.csiro.au

Reference: Bellas, T.E. (1982) *Insects as a cause of inhalant allergies, a bibliography.* (CSIRO, Division of Entomology Report No 25, 2nd edition)

T.E. BELLAS
CSIRO
Division of Entomology
Canberra

On a lighter note, the following item appeared recently in mail from ENTOMO_L at Guelph:

"I understand that USDA's Systematic Entomology Laboratory will soon be requiring taped interviews with all entomological specimens verifying that they were indeed collected at the locations indicated by their appended labels. A requirement for a video-taped interview with type specimens may soon be on the books as a method to prevent the possibility that verbal label data concordance was not obtained under duress. FWS officials are unsure if such measures would be successful in the case of hard bodied taxa (beetles, etc) whose abuse and torture at the hands of field biologists may not be apparent. However, thysanopterans and streblids might benefit by such a protocol. Thank you for your attention to this matter."

COMING EVENTS

A.E.S. 25TH AGM and SCIENTIFIC CONFERENCE

Napier Building
The University of Adelaide
24-28 September 1994

Details were enclosed with the last issue of *Myrmecia*. Further details were given in *Myrmecia* **30**(1): 35 and are available from Dr Andy Austin, Department of Crop Protection, Waite Campus, University of Adelaide, PO Glen Osmond SA 5064. Ph: 08-303.7265, Fax: 08-379.4095.

Please note that all registrations not already received by the Conference organisers will now attract a late fee.

XIVth International Congress for Tropical Medicine and Malaria

"New Goals for the 21st Century"

Nagasaki Japan, 17-22 November 1996

The First Circular of the above Congress is now available. Further information is available from:

Ms S. Tominaga
XIVth ICTM Secretariat
c/- The Institute of Tropical Medicine
Nagasaki University
1-12-4, Sakamoto
Nagasaki, 852 JAPAN

(The editor of this publication has three copies of the first Circular, if anyone wants one)

XX INTERNATIONAL CONGRESS OF ENTOMOLOGY

Florence (Italy)
August 25 - 31, 1996
Palazzo dei Congressi

Information and copies of the registration form can be obtained from:

Organising Secretariat O.I.C.
Via A. La Marmora, 24
50121 Florence
ITALY
Tel. ++39-55-5000631
Fax ++39-55-5001912

THE HORN SCIENTIFIC EXPEDITION TO CENTRAL AUSTRALIA 1894

A Commemorative Symposium
Araluen Centre, Alice Springs
26-27 September 1994

Details in *Myrmecia* **30**(2): 34. Further

information and registration forms from:

Steve Morton
Horn Symposium
PO Box 2111
Alice Springs NT 0871
Ph: 089 500111
Fax: 089 529587
Email: trevor.hobbs@dwe.csiro.au

THE A.J. NICHOLSON CENTENARY MEETING: ON THE FRONTIERS OF POPULATION ECOLOGY

18-22 April 1995, Canberra, Australia

This scientific symposium is a special event to celebrate the birth of A.J. Nicholson (1895-1969) who was Chief of the CSIRO Division of Entomology between 1933 and 1960. It will include presentations on current research on the population ecology of organisms from a broad range of taxa, and from the perspective of theoreticians and applied ecologists.

Further details are available from:

Mrs L. Lawrence
CSIRO Division of Entomology
GPO Box 1700
CANBERRA ACT 2601
FAX: (06) 246 400
Tel: (06) 246 4087
email: louisel@ento.csiro.au

NEW PUBLICATIONS

The following publications on entomological topics have recently been released by Thomas Nelson Australia. The notes provided below come from the advertising blurb distributed by the publisher.

THE INSECTS - An Outline of Entomology,
by P.J. Gullan and P.S. Cranston.

This book addresses entomological issues of a general nature but is not an identification guide. It merges insect ecology and behaviour within a broadly systematic framework. it is fully illustrated with new figures that complement and enhance th text and presents new views on what constitutes success in insects. c.448pp

INSECT NATURAL ENEMIES - Practical Approaches to their Study and Evaluation
Edited by M. Jervis and N. Kidd

This is a general text which presents those approaches and techniques that are most appropriate to the study and evaluation of insect predators, particularly parasitoids. c.500pp

MEDICAL INSECTS AND ARACHNIDS
by R.P. Lane and R.W. Crosskey

This identification guide is an in-depth, consistent and accessible approach providing information on both the identification and practical aspects of tropical and western insects and arthropods. 744pp

IDENTIFICATION OF ARTHROPODS OF HUMANS AND DOMESTIC ANIMALS by A. Walker

On a global scale the problems caused by arthropods and the diseases associated with them are as bad as at any time in history. This book is designed as an introduction for students andlaymen to the familiarisation and identification of medical and veterinary pests. A conventional taxonomic system is followed and a copious reading list allows the reader to continue studies into the fields of disease recognition and pest control. c.176pp.

HOST-PLANT SELECTION BY PHYTOPHAGOUS INSECTS
by E.A. Bernays and R.F. Chapman

In this book, the first to focus on the behaviour of host-plant selection by plant-feeding insects, the

authors cover the patterns found in nature and the chemical features of plants that determine host selection. The sensory systems involved in making the selection are presented together with relevant functional studies. 296pp

MITES - Ecological and Evolutionary Analyses of Life-History Patterns

Edited by M.A. Houck

Mites routinely violate fundamental concepts such as heterochrony, sexual selection, the evolution of sex ratio and ontogeny. Recent research methodologies have made it practical for the first time to perform experimental work with mites. This has given rise to much interesting work, including theories to explain the origin and function of sexual reproduction in general. 356pp.

CATERPILLARS - Ecological and Foraging Constraints on Foraging

Edited by N.E. Stamp and T. Casey

This book reviews the present state of research into caterpillar biology. It details the constraints of the foraging patterns of caterpillars, including phylogenetic constraints, the physical environment, nutritional supply and demand, predators, and plant chemical defences. It also analyses caterpillar adaptations, such as sociality, mutualism, aposematism and cryptic morphology, and covers population dynamics and the influence of environmental factors on tropical, temperate and arctic caterpillars. 548pp.

INSECT CONSERVATION BIOLOGY

by M.J. Samways

This comprehensive book covers a wide range of topics from single species to landscape conservation, and from rare butterflies to the benefits and risks of biocontrol agents. The approach is both positive and realistic, with insects being discussed in the contexts of sustainable development, agroecology and monitoring environmental change. It is the first book to focus on conservation biology of insects and emphasises insects as the most dominant component of biodiversity. c.376pp

Integrated Pest Management P/L

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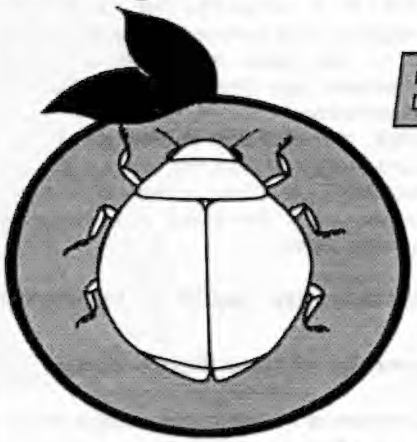

- **CRYPTOLAEMUS** – Ladybird beetles for the control of mealybugs.
- **LEPTOMASTIX** – Parasites of mealybugs in citrus and custard apples.
- **APHYTIS** – Parasites of red scale in citrus.
- **LINDORUS** – Ladybird beetle for the control of scale insects.
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- **YELLOW STICKY TRAPS** – For monitoring & control of whiteflies, thrips and leafhoppers.

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1994 Listing of Postgraduate Projects in Entomology
AN AUSTRALIAN SURVEY
PART 2, August 1994.

Introduction

This is the second edition of the list, which is now produced every two years instead of each year. There are 146 projects listed here, which when added to the 141 published in the May MYRMECIA, adds up to the grand total of **287**. Thanks again to all those who contributed to the list (their names in the brackets before the entries) especially those who sent their entries on disk and saved me a lot of typing and reduced the error factor. Also thanks to those who returned a nil return for their institution, so saving me a follow up letter!!

Please let me know if there is anyone who would be prepared to do the list every other year, and so get back to an annual list. Penny Gullan is analysing the lists published over the years to provide data for a talk she is to give on entomological education at the Annual Conference in Adelaide, so we will all benefit from this.

Jenny ANDERSON
CERIT, UNSW

NEW SOUTH WALES

Charles Sturt University (Riverina)

School of Agriculture

(Dr Lesley Ballantyne, P.D. Slater)

BELL, D. Monitoring oriental fruit moth (*Cydia molesta*) to improve pest management at Cobram , Victoria (MAppSc)

GILL, R. An assessment of the efficacy of imadocioprid (Gaucho®) for the control of redlegged earth mite, *Halotydeus destructor.* (BApp Sc (Agric) Hons)

University of New England

Department of Zoology

(M.K. Notestine)

ANNETTS, R.A. The extraction of the fauna of dry eucalyptus and pine forest litter (Hons, 1992)

SINK, H. The development of stereotypic motorneuron morphologies in the embryo of the fruit fly, *Drosophila melanogaster* (PhD, 1992)

COOMBS, M. Environmental influences of the flight and migratory potential of *Helicoverpa punctigera* and *H. armigera* (Lepidoptera: Noctuidae) (PhD, 1993)

DINNING, P. Evaluation of ten *Bacillus thuringiensis* products for control of light brown apple moth *Epiphyas postvittana* (Walker) (Lepidoptera:Tortricidae) (Hons, 1993)

THOMPSON, D. Pioneering nerve and muscle cells in the silverfish, *Ctenolepisma longicaudata* (Hons, 1993)

ASANTE, S. Biological and ecological studies on the woolly apple aphid, *Eriosoma lanigerum* with reference to control (PhD, submitted 1994)

HOLTKAMP, R. Population ecology of flower head insects on *Senecio madagascariensis* and the closely related *Senecio lautus* complex (PhD, 1994 -joint NSW Ag-UNE, 1994)

SURATMAN. The effects of pesticides on non-target soil arthropods (MSc, 1994)

PARKINSON, L. Colonisation of invertebrates of leaf litter in New England streams (Hons, 1994)

BAKER, A. A comparison of the litter fauna in regrowth and mature woodlands (Hons, 1994)

BIRD, L. Biological effects of Azadirachtin on *Heliothis* spp (Hons, 1994, joint Zoology - Agronomy)

HARRIS, K.L. Sensory neuron growth in normal and mutant *Drosophila* (Hons, 1994)

STRICKSON, M. Cold tolerance in light brown apple moth *Epiphyas postvittana* (Walker) (Hons, 1994)

AUSTRALIAN CAPITAL TERRITORY

University of New South Wales

Department of Physics, University College Australian Defence Force Academy

(Dr Alistair Drake)

HARMAN, I.T. Studies of the biometeorology of insect migration using novel remote-sensing techniques. (PhD)

VICTORIA

University of Melbourne

Department of Zoology
(Dr Jon Martin)

ALLEN, R. The nature of the association between the zodariid spider *Habronestes bradleyi* and the meat ant *Iridomyrmex purpureus* (BSc Hons, 1993)

BROMHAM, L. The effects of grazing on the ground invertebrate fauna of forest remnants (B.Sc Hons)*

COLE, D. Factors promoting the association between pseudoscorpions and ants (B.Sc Hons)

DAWS, A. Insect bioacoustics (PhD)

EVANS, T.A. Evolution of social behaviour in *Diaea* (Araneae, Thomisidae) (PhD)

KING, I. Sound production in the freshwater hereropteran *Micronecta* (MSc)

NAYLOR, M. Function of a cicada muscle (B.Sc Hons, 1993)

***Linda Bromham is a Victorian Rhodes Scholar**

Monash University

Department of Ecology and Evolutionary Biology
(Brian Roberts)

DAY, M. Dynamics of insect colonisation of snags in upland streams (MAppSc)

BARNES, V. Interactions among flower mites, plants and birds (PhD)

BASUKI, E. Ecdysteroid levels during embryonic and post embryonic development of the blowfly *Lucilia cuprina* (PhD)

BROOKS, S. Responses of stream communities to floods (PhD)

DOUGLAS, M. Responses of stream communities to fire in tropical savannah woodland catchments (PhD)

De STEFANO, J. Aggregation behaviour in stream gerrids (Hons)

HOSKING, A. The effect of seed pelleting on removal of eucalypt seeds by ants (MSc)

KINORY, R. Adult diapause in elm leaf beetle: stages sensitive to photoperiodic induction (PhD)

KULKARI, S. Ecological factors controlling growth and reproduction in the light brown apple moth (MSc)

MARSHALL, M. The effects of increasing salinity on insect stream communities (MSc)

NIAS, D. Role of insect detritivores in food web structure of ephemeral wetlands (PhD)

RAYMOND, K. Ecology of the environmental weed *Myrsiphyllum asparagoides* at Point Nepean National Park, Victoria (PhD)

ROSARIO, S. Mites and leaf domatia: implications for agricultural systems (PhD)

WALLACE, D. The influence of leaf domatia on mite distribution and abundance (PhD)

VAZQUEZ, M. Ecology of co-existing insect predators in streams (MSc)

VERTESSY, D. Effects of increasing salinity on a typical lowland macroinvertebrate community, Hughes Creek, Victoria (MAppSc)

TSYRLIN, E. Colonisation of wood in streams by aquatic invertebrates (Hons)

PARNRONG, S. Growth rates and production of mayflies in streams flowing through forest and agricultural land (Hons)

TASMANIA

University of Tasmania

Department of Zoology
(A/Prof. Alistair Richardson)

BELL, P. The biology of the air sac mite, *Sternostoma tracheolum*, in the Gouldian Finch (PhD)

BEVERIDGE. N. Habitat use and thermal ecology of the lycosid spider *Lycosa tasmanica* (Hons)

McCOULL, C. Predator-prey relationships in the aquatic bug *Naucoris congrex* (Hons)

MOORE, M. The water relations of terrestrial amphipod crustaceans (PhD)

NELSON, M. Invertebrate fauna of Tasmanian streams in relation to environmental parameters (MSc)

READ, M. The effects of riparian willows on in-stream fauna (PhD)

ROBSON, B. The influence of habitat complexity on grazing interactions amongst benthos in temperate streams (PhD)

YEATES, L. Comparison of willow and eucalypt litter as food for benthic invertebrates (Hons)

QUEENSLAND

University of Queensland

Department of Entomology

(Sonja Mamin)

ABEELUCK, D. Host relationships and ecology of *Coccophagus* sp., a parasitoid of the lantana mealybug, *Phenacoccus parvus*. (MAgrSc)

BRIER, H. Soybean tolerance to bug attack (MAgrSc)

CEBALLO, F. Aspects on the biology and host relationships of an aphelinid mealy bug parasitoid, *Coccophagus gurneyi* Compere (MAgrSc)

CORCORAN, R. Physiological and behavioural effects of heat in fruit flies of the family Tephritidae. (PhD)

DAHLAN, A. Larval anatomy, development and the determination of nutritional requirements of *Trichogramma* spp. *in vitro*. (PhD)

DILLON, M. Generic algorithms for modelling insect population movement. (MSc)

FLOATER, G. The spatial dynamics of a subtropical herbivore. (PhD)

GIBB, D. Early insect damage and its effect in narrow raw cotton. (MAgrSc)

GRIFFITHS, M. Aspects of the life history and biology of the red cedar tip moth (*Hypsipyla robusta*). (PhD)

GROSTAL, P. The ecology of orb-weaving spiders. (PhD)

HETERICK, B. Revision of the *Chelaner* group in the genus *Monomorium* (Hymenoptera: Formicidae). (PhD)

HOOD, S. Integrated pest management in cashews. (PhD)

HULL, C. The orientation of the Queensland fruit fly, *Bactrocera tryoni* Froggatt, to kairomonal fruit chemicals. (PhD)

JALLOW, M. Host selection and survival of early instars of *Helicoverpa armigera*. (MAgrSc)

KHAN, S. An evaluation of the host specificity and other aspects of the biology of *Epiblema strenuana* (An introduced biological control agent of the weed, *Parthenium* - its future potential). (PhD)

KHUMLEKHASING, M. Species status, host plant relationships, and prey requirements of *Frankliniella schultzei* (Trybom) [Thysanoptera: Thripidae]. (MAgrSc)

LAW, L. Gall fauna of mangroves. (PhD)

LOGAN, D. Studies on the biology of *Negatoria* and childers canegrubs as a basis for development of improved controls. (PhD)

MADDOX, C. Aspects of the biology of *Pyrgoides tigrina* (Chapuis) [Coleoptera: Chrysomelidae] the major pest of *Melaleuca alternifolia* (Maiden & Betche) [Myrtaceae]. (MSc)

MAROHASY, J. The host plant relationship of *Phenacoccus parvus*: a potential biocontrol agent for *Lantana camara*. (PhD)

MILES, M. Population biology of mirids in cotton. (PhD)

MILNE, J. Aspects of the relationships between thrips, plants and viruses. (PhD)

MUDA, R. An investigation into pest management of *Rhizopertha dominica* F. (Coleoptera: Bostrichidae) with azadiractins - enriched neem kernel extracts. (PhD)

NARANGODA, K. An analysis of chemical communication as a means of understanding species status of green vegetable bug populations, *Nezara viridula* (Hemiptera: Pentatomidae) (MAgrSc)

OSMAN, Mohd S. Effect of physical treatment (heat/cold) to the functional and enzymatic systems in fruit fly mortality in achieving quarantine security. (PhD)

PETERS, B. Termite - Fungi Interactions. (MAgrSc)

QUIMIO, G. Mating behaviour as an aid to species studies in the fruitfly parasitoid *Biosteres arisanus* (Sonan) (Hymenoptera: Braconidae). (PhD)

ROCHESTER, W. A generic spatial model of insect population dynamics. (PhD)

SCHOLZ, B. Consumer choice by egg parasitoids: odours and host location. (PhD)

SCHNEIDER, M. A systematic study of Australian Conopidae (Insecta: Diptera). (PhD)

SEXTON, S. A theoretical and field study of codling moth control using a mating disruption system. (MAgrSc)

SPARKS, D. Biological control of fireweed: A pre-release study. (MSc)

VAN KLINKEN, R. The genetical ecology of the *coracina* group of *Drosophila*. (PhD)

VIJAYSEGARAN, S. Studies on the biology of *Bactrocera tryoni* and *B. cucumis* (Diptera: Tephritidae) and their parasitoids. (PhD)

WARD, A. Turfgrass pests in south eastern Queensland. (BScHons)

Department of Botany and Entomology

BOSSELMANN, A. Ecology of the neem tree

(*Azadirachta indica* Juss) (PhD)

Department of Entomology and Anatomy

PAVEY, C. Feeding ecology of insectivorous bats, with emphasis on prey specificity. (PhD)

Department of Entomology and Centre for Tropical Pest Management

BEARD, J. Integrated pest management in protected crops. (PhD)

BENFIELD, M. Dispersal and colonisation in *Heliothis punctigera* (Hübner) in inland Australia. (PhD)

BROUGHTON, S. The effect of *Uroplata girardi* and *Octotoma scabripennis* (Coleoptera: Hispinae) on *Lantana camara.* (PhD)

COOK, J. Interactions between citrus leafminer (*Phyllocnistis citrella* Stainton [Lepidoptera: Gracillariidae]) and its host. (PhD)

GREEN, J. The ecological role of spiders in a citrus agro-ecosystem. (PhD)

HALSTEIN, T. Population dynamics of the root-knot nematode *Meloidogyne* sp. (PhD)

MONSOUR, C. Optimisation of *Bacillus thuringiensis* (Bt) usage in the integrated pest management of *Heliothis.*(PhD)

ROSS, M. Mating behaviour and ecology of some opiine (Braconidae) parasitoids of fruit flies. (PhD)

RUBIA, E. Management of white stem borer *Scirpophaga innotata* (Walker) in West Java. (PhD)

RYAN, M. Genetical variability in Australian and overseas populations of fruit spotting bug (*Amblypelta nitida*), banana-spotting bug (*Amblypelta lutescens*) and Australian and overseas populations of green vegetable bug (*Nezara viridula*). (PhD)

SPOLC, D. Growth response modelling to tip moth (*Hypsipyla robusta*) attack in red cedar (PhD)

STANAWAY, M. Factors affecting the success of insect pest establishment. (PhD)

Tropical Health Program and Department of Entomology

FOLEY, D. Investigations into the *Anopheles punctulatus* complex. (PhD)

MUIR, L. Isolation and application of semiochemicals for *Aedes aegypti.* (PhD)

Gatton College
University of Queensland

(Dr Errol Hassan)

ASTRIDGE, D. An integrated pest management data base of insects and diseases of avocado and mangoes. (BAppSci (Hort.Tech))

COLLINS, M. Efficacy of neem extract on broccoli pests in the field (B.Appl Sc, (Hort. Tech.))

FOREMAN, P. The effect of neem extract on *Helicoverpa (Heliothis)* spp eggs and development of immature stages under laboratory conditions (BAppSc. (Rur. Tech))

HEIMOANA V. The effect of neem extract on Queensland fruit fly (*Bactrocera tryoni* (Froggatt) under laboratory conditions (BAppSci (Hort.Tech))

KAHEYNA, A. The influence of carbohydrate on population dynamics of honey bees (*Apis mellifera* L.) colonies (MAgrSc)

KELLY, J. The effects of neem extract on predatory mite (*Phytoseiulus persimilis* Athias-Henriot) under laboratory conditions (BAppSc. (Rur. Tech))

McLACHLAN, S. Testing the insecticidal effects of neem extract on tea red spider mites, *Oligonychus coffeae* (Nietner) in avocados (BAppSci (Hort.Tech))

NOLAN, P. Parasite and predator survey of tomato pests grown in the Lockyer Valley (BAppSc. (Rur. Tech))

PFEFFER, M. Cultural and chemical methods of controlling insect damage on *Eucalyptus dunnii* (BAppSci (Hort.Tech))

RAZZAQUE, Q.M. Research on biology and ecology of the duboisia leaf beetle (*Psylliodes parilis* Weise)(PhD)

SANDERSON, A. Effects of neem (*Azadirachtin indica)* extract on two key pests of the cashew tree (GradDip)

SCHLACK, S. Quarantine status of the fruit fly *Atherigona orientalis* (Schiner) in export cucurbits (MAgrSc)

SCHMIDT, M. The effects of different artificial media on African black beetle (*Heteronychus arator* F.) weight and fecundity (BAppSci (Hort.Tech))

James Cook University

Department of Zoology

(Dr Philip Weinstein)

BARTAREAU, T. Comparative foraging strategies

and competition between *Apis mellifera* and *Trigona* bees in North-east Queensland. (PhD)

BENSEN, L Ecology of tropical stream insect communities. (PhD)

BRABY, M. Life history strategies of tropical satyrine butterflies (PhD, Submitted)

CLAYTON, P. Ecology of tropical waterfall faunas (PhD)

DERRINGTON, C. Methods for assessing arthropod diversity and herbivory in mangroves (Pg Dip)

FELLOWS, A. Biogeography of cave faunae in tropical Queensland (M Qual)

HURLEY, M. Herbivory on two species of Stinging Tree in upland tropical rain forests (PhD)

JACKSON, R. Insect herbivory on rainforest and wet sclerophyll *Alphitonia* (PhD)

KAY, I. Developmental biology of *Eysarcoris trimaculatus* (MSc, submitted).

JOHNSON, M.I. Monitoring the effect of Homoptera on *Leucaena* (MSc, submitted)

JUNIPER, P. Importance of insect seed predation in tropical rain forests (PhD)

MURRAY-SMITH, S. Malaria receptivity and screening at Charters Towers, North Queensland. (Pg Dip)

OVERTON, M. Effects of urbanisation on tropical butterfly assemblages (PhD)

PEARSON, S. Physiological adaptations of tropical troglobites (Hons)

PODGER, D. Mimicry and herbivory in Australian mistletoes (Hons)

PRASAD, M. Feeding ecology of herbivorous coccinellids (*Epilachna* spp) (PhD)

ROESLI, R. Pest status of Psocoptera in tropical grain silos (PhD)

ROSSER, Z. Role of disturbance in tropical stream insect communities (PhD)

RUSSELL, B. Biological control of dengue mosquitoes (Hons)

RUSSELL, S. Ecology of vector mosquitoes in seasonal aquatic vegetation (Hons)

SLANEY, D. Evolutionary origins of tropical cave cockroaches (PhD)

THURGATE , M. Impact of adjacent mining on Karst and cave biota at Chillagoe, North Queensland (Pg Dip)

VITELLI, M. Biological control of an introduced tropical weed. (MSc)

WILKIE, L. The biology and management of banana scab moth. (PhD)

Griffith University

(Dr Jane Hughes)

BOULTON, S. Moth assemblages from subtropical rainforest canopies (Hons)

GALLAGHER, L. Gene flow among populations of two species of insect in the Conondale Range (Hons).

HURWOOD,. D. The effect of larval diet on susceptibility to fenvalerate in *Helicoverpa armigera* (Hons).

KAY, D. Importance of riparian insects to the diet of stream fish (MPhil)

MARSHALL, J. Food web structure in rainforest stream pools (PhD).

ROGERS, D. The influence between soil moisture and vegetation type on Collembola (Hons).

SMITH, I. Importance of aquatic insects to adjacent terrestrial food webs (Hons).

WEST AUSTRALIA

Murdoch University

School of Biological and Environmental Sciences (Environmental Science Division)

(Dr M C Calver)

CHARLTON, L. The ecology of dragonfly fauna at Millstream, W.A., with emphasis on the impact of aquatic plant invasion (PhD)

LATCHFORD, J. Mosquito control in wetlands: the effectiveness and impact of runnelling techniques (PhD)

TRAYLER, K. The effectiveness of 30m buffer zones in ameliorating the impact of silvicultural activity on stream water quality and macroinvertebrate quality (PhD)

NEW SOUTH WALES

University of Western Sydney Hawkesbury Campus

(R. Spooner-Hart)

Faculty of Agriculture and Horticulture

CANT,R. Biology of the Bronze Orange Bug, *Musgraveia sulciventris.* (PhD)

HOWPAGE, D. Pollination of certain fruit crops and its influence on yield and quality parameters, and pollination enhancement with synthetic queen mandibular pheromone (PhD)

ISSAC, M. Biology and population dynamics of *Heliothrips haemorrhoidalis* (PhD)

JOHNSTON,S. Field evaluation of *Apis mellifera* in south-east Asia (MSc)

NICHOLAS, A. Assessment of secondary pests and beneficial arthropods in orchards using pheromone mating disruption for codling moth (MSc)

NGUYEN, N. Aspects of management of honeybee colonies for queen rearing (Grad Dip)

REDGROVE, H. Development of IPM in northern Australian potato production (BScHons)

SINGH, S. Biology and control of the rice leafroller *Cnaphrocrosis exigua* (Lep: Pyralidae) in Fiji (PhD)

School of Food Technology

PELEA, N. Use of neem (*Azadirachta indica*) extracts to reduce attack of smoked fish by redlegged ham beetle (PhD)

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